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ABSTRACT

This document presents the executive summary of the National Assessment of Educational Progress (NAEP) 1992 mathematics assessment. It included nearly 250,000 fourth, eighth, and twelfth grade students attending approximately 10,000 schools across the United States. The results from the assessment indicate that student performance is improving nationally and in some states, but a considerable challenge remains. Proportions of students at the higher achievement levels continue to be low, particularly for those subpopulations of students historically considered to be "at risk." Major findings include: (1) for the United States there were statistically significant increases in average mathematics proficiency between 1990 and 1992 for fourth, eighth, and twelfth grade students; (2) just over 60% of the students in grades 4, 8, and 12 were estimated to be at or above the basic level on the assessment; (3) within and across participating states and territories there was considerable variation in performance; (4) the increases in mathematics proficiency between 1990 and 1992 did little to alter the relative standings of the demographic groups; and (5) a number of gains were noted for the United States as a whole, and the states in the mathematics content areas assessed. (JRH)

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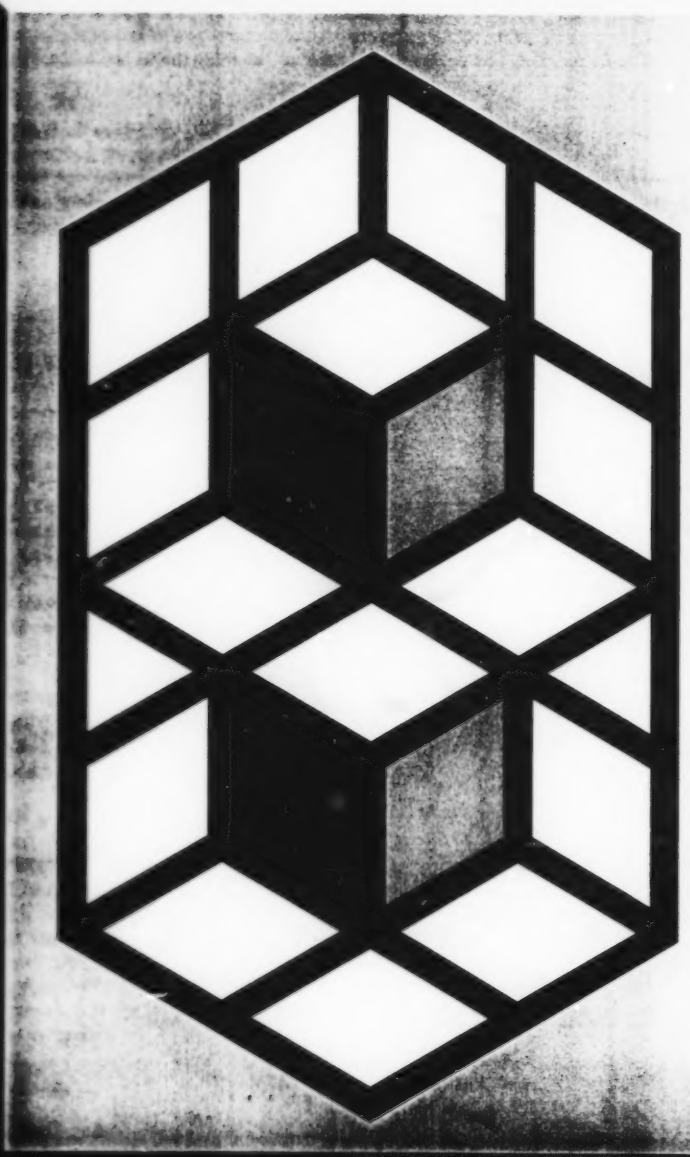
Executive Summary of the NAEP 1992 Mathematics Report Card for the Nation and the States

Data from the National and Trial State Assessments



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THE NATION'S REPORT CARD

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What is The Nation's Report Card?

THE NATION'S REPORT CARD, the National Assessment of Educational Progress (NAEP), is the only nationally representative and continuing assessment of what America's students know and can do in various subject areas. Since 1969, assessments have been conducted periodically in reading, mathematics, science, writing, history/geography, and other fields. By making objective information on student performance available to policymakers at the national, state, and local levels, NAEP is an integral part of our nation's evaluation of the condition and progress of education. Only information related to academic achievement is collected under this program. NAEP guarantees the privacy of individual students and their families.

NAEP is a congressionally mandated project of the National Center for Education Statistics, the U.S. Department of Education. The Commissioner of Education Statistics is responsible, by law, for carrying out the NAEP project through competitive awards to qualified organizations. NAEP reports directly to the Commissioner, who is also responsible for providing continuing reviews, including validation studies and solicitation of public comment, on NAEP's conduct and usefulness.

In 1988, Congress created the National Assessment Governing Board (NAGB) to formulate policy guidelines for NAEP. The board is responsible for selecting the subject areas to be assessed, which may include adding to those specified by Congress; identifying appropriate achievement goals for each age and grade; developing assessment objectives; developing test specifications; designing the assessment methodology; developing guidelines and standards for data analysis and for reporting and disseminating results; developing standards and procedures for interstate, regional, and national comparisons; improving the form and use of the National Assessment; and ensuring that all items selected for use in the National Assessment are free from racial, cultural, gender, or regional bias.

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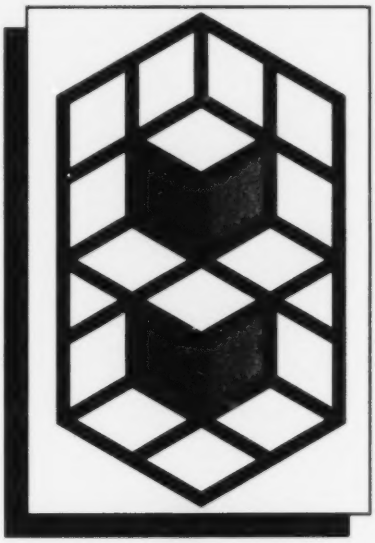
Executive Summary of the NAEP 1992 Mathematics Report Card for the Nation and the States

Data from the National and Trial State Assessments



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Report No. 23-ST03 April 1993

THE NATION'S REPORT CARD

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EXECUTIVE SUMMARY

The results from NAEP's 1992 mathematics assessment indicate that student performance is improving nationally and in some states, but that a considerable challenge remains. Proportions of students at the higher achievement levels continue to be low, particularly for those subpopulations of students historically considered to be "at risk."

MAJOR FINDINGS

- For the nation, there were statistically significant increases in average mathematics proficiency between 1990 and 1992 for fourth-, eighth-, and twelfth-grade students, both public and private schools combined. Eighteen of 37 states and territories that participated in the grade 8 Trial State Assessment Program in both 1990 and 1992 showed significantly increased average mathematics proficiency for their public-school students.

- Despite these positive findings, just over 60 percent of the students in grades 4, 8, and 12 were estimated to be at or above the Basic level on the 1992 mathematics assessment. At this level, students should exhibit partial mastery of the knowledge and skills fundamental for proficient work.

Nationally, across the three grades, 25 percent or fewer were estimated to be at the Proficient level or beyond, where students should exhibit evidence of solid academic performance. The percentages of students attaining the Advanced level, where students should exhibit superior performance, ranged from an estimated 2 to 4 percent.

- Within and across participating states and territories, there was considerable variation in performance. At grade 4, the percentages of students estimated to be at the Basic level or beyond ranged from 25 to 76 percent, while those at grade 8 ranged from 13 to 82 percent. The percentages of fourth and eighth graders estimated to be at or above the Proficient level ranged from 5 to 25 percent and from 1 to 37 percent, respectively. From 0 to 6 percent of the fourth and eighth graders were estimated to have attained the Advanced level.

- The states with the highest average mathematics proficiency at grade 4 included Maine, Iowa, New Hampshire, Wisconsin, North Dakota, Minnesota, New Jersey, Connecticut, Massachusetts, and Nebraska. At grade 8, the top-performing states included Iowa, North Dakota, Minnesota, Maine, New Hampshire, Wisconsin, and Nebraska.

- The Southeast continued to trail behind the Northeast, Central, and West at all three grades assessed.

- Asian/Pacific Islander and White students had higher average mathematics proficiency than did Black students, with American Indian and Hispanic students performing somewhere in between. Two-thirds or more of the Asian/Pacific Islander and White students were estimated to have achievement at or above the Basic level, while fewer than one-half of the American Indian, Black,

and Hispanic students demonstrated achievement at the partial mastery level.

- Gender differences were not large, but males tended to outperform female students at grade 12. For example, 18 percent of the males were estimated to be at or above the Proficient level compared to 14 percent of the females.

- The increases in mathematics proficiency between 1990 and 1992 for the nation and in many states did little to alter the relative standings of the demographic groups.

  - Average performance increased for White students at all three grades. The only other statistically significant gains in average mathematics proficiency by racial/ethnic group were found for Black and Hispanic students at grade 12.

  - Average mathematics proficiency for both males and females increased at all three grades.

  - Students attending schools in the top one-third of the performance distribution showed increased mathematics proficiency at all three grades. The only gain for students attending schools in the bottom one-third of the distribution occurred at grade 12.

- A number of gains were noted for the nation and the states in the mathematics content areas assessed by NAEP, including Numbers and Operations, Measurement, Geometry, Data Analysis/Statistics, and Algebra.

- Seventy-two percent of the fourth graders and nearly all of the eighth and twelfth graders were estimated to have shown some success in addition, subtraction, and simple problem solving with whole numbers.

- Approximately one-fifth of the fourth graders, two-thirds of the eighth graders, and 90 percent of the twelfth graders were estimated to have also demonstrated ability in solving two-step problems involving multiplication and division.

- One-fifth and one-half of the students at grades 8 and 12, respectively, were estimated to have solved problems involving fractions, decimals, and percents as well as elementary concepts in geometry, statistics, and algebra.

- Only 6 percent of the high-school seniors and 1 percent of the eighth graders were estimated to have demonstrated consistent success in the areas of geometric relationships, algebra, and functions.

The Scope of NAEP's 1992 Mathematics Assessment

NAEP's 1992 mathematics assessment included nearly 250,000 fourth-, eighth-, and twelfth-grade students attending approximately 10,000 schools across the nation and the states. The assessment itself was forward-looking, comprising several hundred questions at each of the grades assessed. Consistent with standards developed by the National Council of Teachers of Mathematics, many questions required students to construct their responses and some questions asked for explanations of their reasoning. For various portions of the assessment, mathematical tools and aids were supplied, including scientific calculators, protractor/rulers, and geometric shapes. One portion was administered using a special audiotape to pace students through estimation questions.

Nationally representative samples of students attending both public and private schools were assessed at grades 4, 8, and 12. In addition, representative samples of fourth and eighth graders attending public schools were assessed in each of 44 jurisdictions. Thus, tables containing only national data present results for public- and private-school students combined, whereas tables containing state data present results only for public-school students.

These participants include:

Alabama	**Louisiana**	**Ohio**
Arizona	Maine	**Oklahoma**
Arkansas	**Maryland**	**Pennsylvania**
California	Massachusetts	**Rhode Island**
Colorado	**Michigan**	South Carolina
Connecticut	**Minnesota**	Tennessee
Delaware	Mississippi	**Texas**
District of Columbia	Missouri	Utah
Florida	**Nebraska**	**Virginia**
Georgia	**New Hampshire**	**West Virginia**
Hawaii	**New Jersey**	**Wisconsin**
Idaho	**New Mexico**	**Wyoming**
Indiana	**New York**	
Iowa	**North Carolina**	**Guam**
Kentucky	**North Dakota**	**Virgin Islands***

* The Virgin Islands participated in the testing portion of the 1992 Trial State Assessment Program. However, in accordance with the legislation providing for participants to review and give permission for release of their results, the Virgin Islands chose not to release their results at grade 4 in the national composite report.

Trend results from a comparable assessment conducted in 1990 are available for the nation and for the 37 states and territories (noted above in bold-faced type) that participated in both the 1990 and 1992 programs at grade 8. NAEP's Trial State Assessment Program was begun in 1990 at grade 8 and expanded in 1992 to include both grades 4 and 8.

Achievement Levels

As part of its statutory responsibilities, the National Assessment Governing Board (NAGB) established three achievement levels for reporting NAEP results: Basic, Proficient, and Advanced. The Basic level denotes partial mastery of the knowledge and skills fundamental for Proficient work at each grade. Proficient, the central level, represents solid academic performance and demonstrated competence over challenging subject matter. This is the achievement level the Board has determined all students should reach. The Advanced level signifies superior performance beyond Proficient. The process of setting achievement levels incorporated the views of a broadly representative body of teachers, administrators, and interested members of the public, and enables NAEP data to be reported in terms of what students *should* be able to do.

TABLE 1 presents average mathematics proficiency and performance for the achievement levels at grades 4, 8, and 12 for both 1992 and 1990. The improvement in mathematics performance between 1990 and 1992 is clear. However, more than one-third of the students at all three grades did not reach the lowest level of performance, and no statistically significant increases were found at the Advanced level. The cutpoints for the achievement levels on NAEP's 0 to 500 mathematics proficiency scale are shown in TABLE 2.

TABLE 1 National Overall Average Mathematics Proficiency and Achievement Levels, Grades 4, 8, and 12

			Percentage of Students At or Above			
Grades	**Assessment Years**	**Average Proficiency**	**Advanced**	**Proficient**	**Basic**	**Percentage Below Basic**
4	**1992**	218(0.7)>	2(0.3)	18(1.0)>	61(1.0)>	**39(1.0)<**
	1990	213(0.9)	1(0.4)	13(1.1)	54(1.4)	**46(1.4)**
8	**1992**	268(0.9)>	4(0.4)	25(1.0)>	63(1.1)>	**37(1.1)<**
	1990	263(1.3)	2(0.4)	20(1.1)	58(1.4)	**42(1.4)**
12	**1992**	299(0.9)>	2(0.3)	16(0.9)	64(1.2)>	**36(1.2)<**
	1990	294(1.1)	2(0.3)	13(1.0)	59(1.5)	**41(1.5)**

>The value for 1992 was significantly higher than the value for 1990 at about the 95 percent confidence level.
< The value for 1992 was significantly lower than the value for 1990 at about the 95 percent confidence level. The standard errors of the estimated percentages and proficiencies appear in parentheses. It can be said with 95 percent confidence that for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample. In comparing two estimates, one must use the standard error of the difference (see Appendix for details).

TABLE 2 Mathematics Proficiency (Scale-Score Cutpoint) Corresponding to Each Achievement Level, Grades 4, 8, and 12

Grades	Advanced	Proficient	Basic
4	280	248	211
8	331	294	256
12	366	334	287

Comparable information for students attending schools ranked by their students' achievement on the assessment is found in TABLE 3. Students in the top one-third of the schools outperformed their counterparts in the bottom one-third of schools by substantial margins, and they showed more improvement between the 1990 and 1992 assessments, especially at grades 4 and 8.

TABLE 3 Average Mathematics Proficiency and Achievement Levels for the Top One-Third of the Schools and the Bottom One-Third of the Schools, Grades 4, 8, and 12

				Percentage of Students At or Above			
	Assessment Years	Percent of Students	Average Proficiency	Advanced	Proficient	Basic	Percentage Below Basic
Grades 4							
Top One-Third Schools	1992	34(2.8)	237(0.8)>	5(0.8)	34(1.5)>	84(1.0)>	16(1.0)<
	1990	34(3.9)	229(1.4)	3(1.1)	25(2.6)	76(1.8)	24(1.8)
Bottom One-Third Schools	1992	29(2.1)	196(1.2)	0(0.1)	4(0.5)	32(1.5)	68(1.5)
	1990	30(3.4)	194(1.7)	0(0.2)	4(0.9)	29(2.5)	71(2.5)
Grades 8							
Top One-Third Schools	1992	29(3.1)	289(1.3)>	8(1.1)	45(2.0)>	86(1.5)>	14(1.5)<
	1990	30(4.4)	280(1.2)	5(1.0)	35(2.0)	78(1.7)	22(1.7)
Bottom One-Third Schools	1992	32(1.8)	245(0.9)	0(0.3)	8(0.8)	37(1.4)	63(1.4)
	1990	34(3.9)	244(1.8)	0(0.3)	8(1.3)	36(2.0)	64(2.0)
Grades 12							
Top One-Third Schools	1992	35(3.1)	316(1.1)>	4(0.7)	29(1.5)	82(1.3)>	18(1.3)<
	1990	34(5.0)	310(1.2)	4(0.9)	23(2.3)	77(1.8)	23(1.8)
Bottom One-Third Schools	1992	27(2.2)	279(1.0)>	0(0.2)	5(0.9)	40(1.6)	60(1.6)
	1990	26(3.3)	274(1.5)	0(0.2)	3(0.9)	35(2.7)	65(2.7)

> The value for 1992 was significantly higher than the value for 1990 at about the 95 percent confidence level. < The value for 1992 was significantly lower than the value for 1990 at about the 95 percent confidence level. The standard errors of the estimated percentages and proficiencies appear in parentheses. It can be said with 95 percent confidence for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample. When the proportion of students is either 0 percent or 100 percent, the standard error is inestimable. However, percentages 99.5 percent and greater were rounded to 100 percent and percentages 0.5 percent or less were rounded to 0 percent.

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Average proficiency and achievement level data for the participating jurisdictions at grades 4 and 8 are presented in TABLE 4. Even though there was considerable variation in performance across the states, the results tend to parallel those of the nation. Percentages of students reaching the Advanced and Proficient achievement levels remain low, although progress was made between 1990 and 1992 at grade 8. (Please note that the national and regional results included in TABLE 4 and in other tables containing state data will differ from those provided for the entire sample of private- and public-school students as shown in TABLE 5. To be comparable to the data for states and territories, the national and regional results in these tables are based only on students attending public schools.)

TABLE 4 | **Overall Average Mathematics Proficiency and Achievement Levels**

PUBLIC SCHOOLS	Grade 4 - 1992				
	Average Proficiency	Percentage of Students At or Above Advanced	Percentage of Students At or Above Proficient	Percentage of Students At or Above Basic	Percentage of Students Below Basic
NATION	217 (0.8)	2 (0.3)	18 (1.1)	59 (1.1)	41 (1.1)
Northeast	223 (2.1)	3 (0.8)	23 (2.9)	64 (3.0)	36 (3.0)
Southeast	209 (1.9)	1 (0.4)	11 (1.4)	48 (2.5)	52 (2.5)
Central	222 (2.2)	2 (0.6)	20 (2.1)	66 (3.2)	34 (3.2)
West	217 (1.6)	2 (0.7)	17 (2.1)	59 (2.2)	41 (2.2)
STATES					
Alabama	207 (1.6)	1 (0.2)	10 (1.3)	45 (2.2)	55 (2.2)
Arizona	214 (1.1)	1 (0.3)	13 (0.9)	55 (1.7)	45 (1.7)
Arkansas	209 (0.9)	1 (0.2)	10 (0.8)	49 (1.3)	51 (1.3)
California	207 (1.6)	2 (0.5)	13 (1.2)	48 (2.0)	52 (2.0)
Colorado	220 (1.0)	2 (0.4)	18 (1.1)	62 (1.4)	38 (1.4)
Connecticut	226 (1.2)	4 (0.6)	25 (1.4)	69 (1.5)	31 (1.5)
Delaware	217 (0.8)	2 (0.4)	17 (0.8)	56 (1.0)	44 (1.0)
Dist. Columbia	191 (0.5)	1 (0.2)	6 (0.3)	25 (1.0)	75 (1.0)
Florida	212 (1.5)	2 (0.4)	14 (1.4)	53 (2.0)	47 (2.0)
Georgia	214 (1.3)	2 (0.4)	16 (1.2)	55 (1.7)	45 (1.7)
Hawaii	213 (1.3)	2 (0.4)	15 (1.0)	54 (1.8)	46 (1.8)
Idaho	220 (1.0)	1 (0.3)	16 (1.1)	64 (1.7)	36 (1.7)
Indiana	220 (1.1)	2 (0.3)	16 (1.1)	62 (1.6)	38 (1.6)
Iowa	229 (1.1)	3 (0.5)	27 (1.3)	74 (1.4)	26 (1.4)
Kentucky	214 (1.0)	1 (0.5)	13 (1.1)	53 (1.5)	47 (1.5)
Louisiana	203 (1.4)	1 (0.2)	8 (0.8)	41 (2.0)	59 (2.0)
Maine	231 (1.0)	3 (0.6)	28 (1.5)	76 (1.3)	24 (1.3)
Maryland	216 (1.3)	3 (0.4)	19 (1.2)	57 (1.6)	43 (1.6)
Massachusetts	226 (1.2)	3 (0.5)	24 (1.5)	70 (1.6)	30 (1.6)
Michigan	219 (1.8)	2 (0.5)	19 (1.7)	62 (2.2)	38 (2.2)
Minnesota	227 (0.9)	3 (0.5)	27 (1.2)	72 (1.4)	28 (1.4)
Mississippi	200 (1.1)	0 (0.1)	7 (0.7)	37 (1.3)	63 (1.3)
Missouri	221 (1.2)	2 (0.3)	19 (1.3)	64 (1.6)	36 (1.6)
Nebraska	224 (1.3)	3 (0.5)	23 (1.7)	68 (1.8)	32 (1.8)
New Hampshire	229 (1.2)	3 (0.6)	26 (1.7)	74 (1.6)	26 (1.6)
New Jersey	226 (1.5)	3 (0.7)	25 (1.6)	70 (2.1)	30 (2.1)
New Mexico	212 (1.5)	1 (0.4)	11 (1.3)	52 (1.9)	48 (1.9)
New York	217 (1.3)	2 (0.3)	17 (1.3)	59 (1.9)	41 (1.9)
North Carolina	211 (1.1)	2 (0.4)	13 (0.9)	52 (1.6)	48 (1.6)
North Dakota	228 (0.8)	2 (0.3)	23 (1.1)	74 (1.2)	26 (1.2)
Ohio	217 (1.2)	2 (0.3)	17 (1.1)	59 (1.7)	41 (1.7)
Oklahoma	219 (1.0)	1 (0.4)	14 (1.1)	62 (1.6)	38 (1.6)
Pennsylvania	223 (1.4)	3 (0.5)	23 (1.5)	66 (1.9)	34 (1.9)
Rhode Island	214 (1.6)	2 (0.4)	14 (1.2)	56 (2.2)	44 (2.2)
South Carolina	211 (1.1)	1 (0.3)	13 (1.1)	49 (1.5)	51 (1.5)
Tennessee	209 (1.4)	1 (0.2)	10 (1.0)	49 (2.1)	51 (2.1)
Texas	217 (1.3)	2 (0.5)	16 (1.3)	58 (1.7)	42 (1.7)
Utah	223 (1.0)	2 (0.3)	20 (1.1)	67 (1.6)	33 (1.6)
Virginia	220 (1.3)	3 (0.7)	19 (1.6)	60 (1.4)	40 (1.4)
West Virginia	214 (1.1)	1 (0.3)	13 (1.0)	54 (1.6)	46 (1.6)
Wisconsin	228 (1.1)	3 (0.5)	25 (1.4)	72 (1.3)	28 (1.3)
Wyoming	224 (1.0)	2 (0.3)	19 (1.2)	70 (1.4)	30 (1.4)
TERRITORY					
Guam	191 (0.8)	0 (0.1)	5 (0.5)	28 (1.2)	72 (1.2)

The standard errors of the estimated percentages and proficiencies appear in parentheses. It can be said with 95 percent certainty that for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample. When the proportion of students is either 0 percent or 100 percent, the standard error is inestimable. However, percentages 99.5 percent and greater were rounded to 100 percent and percentages less than 0.5 percent were rounded to 0 percent.

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TABLE 4 | **Overall Average Mathematics Proficiency and Achievement Levels (continued)**

PUBLIC SCHOOLS	Grade 8 - 1992					Grade 8 - 1990				
	Average Proficiency	Percentage of Students At or Above Advanced	Percentage of Students At or Above Proficient	Percentage of Students At or Above Basic	Percentage of Students Below Basic	Average Proficiency	Percentage of Students At or Above Advanced	Percentage of Students At or Above Proficient	Percentage of Students At or Above Basic	Percentage of Students Below Basic
NATION	266 (1.0)	3 (0.5)	23 (1.1)	61 (1.2)	39 (1.2)	262 (1.4)	2 (0.4)	19 (1.2)	57 (1.4)	43 (1.4)
Northeast	267 (3.0)	5 (1.4)	25 (3.0)	59 (3.9)	41 (3.9)	270 (3.3)	3 (1.0)	26 (3.1)	65 (3.7)	35 (3.7)
Southeast	258 (1.2)	1 (0.4)	16 (1.0)	53 (1.6)	47 (1.6)	254 (2.6)	2 (0.6)	15 (2.2)	48 (3.0)	52 (3.0)
Central	273 (2.2)	3 (0.7)	28 (3.0)	70 (2.8)	30 (2.8)	265 (2.3)	2 (0.6)	20 (2.1)	61 (2.5)	39 (2.5)
West	267 (2.1)	4 (1.1)	24 (2.1)	62 (2.7)	38 (2.7)	261 (2.6)	3 (0.7)	19 (2.5)	57 (2.6)	43 (2.6)
STATES										
Alabama	251 (1.7)	1 (0.3)	12 (1.1)	44 (2.0)	56 (2.0)	253 (1.1)	1 (0.2)	12 (0.8)	47 (1.6)	53 (1.6)
Arizona	265 (1.3) >	2 (0.4)	19 (1.4)	61 (1.8) >	39 (1.8) <	260 (1.3)	1 (0.4)	16 (1.1)	55 (1.8)	45 (1.8)
Arkansas	255 (1.2)	1 (0.3)	13 (1.0)	50 (1.7)	50 (1.7)	256 (0.9)	1 (0.2)	12 (1.0)	51 (1.3)	49 (1.3)
California	260 (1.7)	3 (0.7)	20 (1.4)	55 (2.0)	45 (2.0)	256 (1.3)	2 (0.4)	16 (1.3)	51 (1.6)	49 (1.6)
Colorado	272 (1.1) >	2 (0.5)	26 (1.3) >	69 (1.3) >	31 (1.3) <	267 (0.9)	2 (0.4)	22 (1.0)	64 (1.1)	36 (1.1)
Connecticut	273 (1.1) >	4 (0.6)	30 (1.1) >	69 (1.4)	31 (1.4)	270 (1.0)	4 (0.4)	26 (1.1)	66 (1.3)	34 (1.3)
Delaware	262 (1.0)	3 (0.4)	18 (1.1)	57 (1.2)	43 (1.2)	261 (0.9)	2 (0.5)	19 (0.9)	55 (1.3)	45 (1.3)
Dist. Columbia	234 (0.9) >	1 (0.2)	6 (1.0)	26 (1.3) >	74 (1.3) <	231 (0.9)	1 (0.2)	4 (0.7)	21 (1.0)	79 (1.0)
Florida	259 (1.5)	2 (0.4)	18 (1.3)	55 (1.9)	45 (1.9)	255 (1.3)	2 (0.4)	15 (1.0)	49 (1.4)	51 (1.4)
Georgia	259 (1.2)	1 (0.3)	16 (1.0)	53 (1.5)	47 (1.5)	259 (1.3)	3 (0.5)	17 (1.3)	53 (1.5)	47 (1.5)
Hawaii	257 (0.9) »	2 (0.4)	16 (0.8)	51 (1.2) »	49 (1.2) «	251 (0.8)	2 (0.4)	14 (0.8)	45 (1.0)	55 (1.0)
Idaho	274 (0.8) >	3 (0.4)	27 (1.2)	73 (1.1)	27 (1.1)	271 (0.8)	2 (0.4)	23 (1.4)	70 (1.2)	30 (1.2)
Indiana	269 (1.2)	3 (0.4)	24 (1.3)	66 (1.5)	34 (1.5)	267 (1.1)	3 (0.6)	21 (1.2)	63 (1.6)	37 (1.6)
Iowa	283 (1.0) »	5 (0.7)	37 (1.4) >	81 (1.2) >	19 (1.2) <	278 (1.1)	4 (0.5)	30 (1.5)	76 (1.1)	24 (1.1)
Kentucky	261 (1.1) >	2 (0.4)	17 (1.1)	57 (1.3) >	43 (1.3) <	257 (1.2)	1 (0.2)	14 (0.9)	51 (1.8)	49 (1.8)
Louisiana	249 (1.7)	1 (0.2)	10 (1.2)	42 (2.0)	58 (2.0)	246 (1.2)	1 (0.2)	8 (1.0)	39 (1.7)	61 (1.7)
Maine	276 (1.0)	4 (0.6)	31 (1.9)	77 (1.3)	23 (1.3)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Maryland	264 (1.3)	4 (0.6)	24 (1.3)	59 (1.5)	41 (1.5)	261 (1.4)	3 (0.6)	20 (1.2)	56 (1.7)	44 (1.7)
Massachusetts	272 (1.1)	3 (0.5)	28 (1.4)	68 (1.5)	32 (1.5)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Michigan	267 (1.4)	3 (0.5)	23 (1.7)	63 (1.6)	37 (1.6)	264 (1.2)	2 (0.4)	20 (1.4)	60 (1.4)	40 (1.4)
Minnesota	282 (1.0) »	6 (0.7) >	37 (1.2) »	79 (1.2) >	21 (1.2) <	275 (0.9)	4 (0.4)	29 (1.2)	74 (1.3)	26 (1.3)
Mississippi	246 (1.2)	0 (0.2)	8 (0.8)	38 (1.5)	62 (1.5)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Missouri	270 (1.2)	3 (0.4)	24 (1.3)	68 (1.6)	32 (1.6)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Nebraska	277 (1.1)	4 (0.5)	32 (1.9)	75 (1.2)	25 (1.2)	276 (1.0)	4 (0.6)	30 (1.4)	74 (1.1)	26 (1.1)
New Hampshire	278 (1.0) »	3 (0.6)	30 (1.5) >	77 (1.0) >	23 (1.0) <	273 (0.9)	3 (0.5)	25 (1.2)	71 (1.6)	29 (1.6)
New Jersey	271 (1.6)	4 (0.6)	26 (1.4)	67 (1.8)	33 (1.8)	270 (1.1)	4 (0.5)	25 (1.3)	65 (1.6)	35 (1.6)
New Mexico	259 (0.9) >	1 (0.3)	14 (1.0)	54 (1.4)	46 (1.4)	256 (0.7)	1 (0.3)	13 (0.9)	51 (1.3)	49 (1.3)
New York	266 (2.1)	4 (0.6)	24 (1.6) >	62 (2.3)	38 (2.3)	261 (1.4)	3 (0.5)	19 (1.0)	57 (1.7)	44 (1.7)
North Carolina	258 (1.2) »	1 (0.3)	15 (1.0) >	53 (1.5) »	47 (1.5) «	250 (1.1)	1 (0.4)	11 (0.8)	44 (1.4)	56 (1.4)
North Dakota	283 (1.2)	4 (0.6)	36 (1.7)	82 (1.3)	18 (1.3)	281 (1.2)	4 (0.6)	34 (2.0)	81 (1.6)	19 (1.6)
Ohio	267 (1.5)	2 (0.5)	22 (1.4)	64 (2.0)	36 (2.0)	264 (1.0)	2 (0.3)	19 (1.2)	60 (1.4)	40 (1.4)
Oklahoma	267 (1.2) >	2 (0.3)	21 (1.2) >	65 (2.0)	35 (2.0)	263 (1.3)	2 (0.5)	17 (1.3)	59 (1.6)	41 (1.6)
Pennsylvania	271 (1.5)	3 (0.7)	26 (1.5)	67 (1.7)	33 (1.7)	266 (1.6)	2 (0.4)	21 (1.5)	63 (2.0)	37 (2.0)
Rhode Island	265 (0.7) »	2 (0.3)	20 (1.3)	62 (1.2) »	38 (1.2) «	260 (0.6)	2 (0.3)	18 (1.0)	55 (0.9)	45 (0.9)
South Carolina	260 (1.0)	2 (0.5)	18 (1.1)	53 (1.2)	47 (1.2)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Tennessee	258 (1.4)	1 (0.4)	15 (1.2)	53 (1.8)	47 (1.8)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Texas	264 (1.3) >	4 (0.6)	21 (1.4) >	58 (1.5) >	42 (1.5) <	258 (1.4)	2 (0.4)	16 (1.0)	52 (1.7)	48 (1.7)
Utah	274 (0.7)	3 (0.5)	27 (1.1)	72 (1.3)	28 (1.3)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Virginia	267 (1.2)	3 (0.5)	23 (1.2)	62 (1.6)	38 (1.6)	264 (1.5)	4 (0.8)	21 (1.6)	58 (1.6)	42 (1.6)
West Virginia	258 (1.0)	1 (0.2)	13 (0.9)	52 (1.5)	47 (1.5)	256 (1.0)	1 (0.2)	12 (0.9)	49 (1.2)	51 (1.2)
Wisconsin	277 (1.5)	4 (0.6)	32 (1.4)	76 (1.9)	24 (1.9)	274 (1.3)	4 (0.5)	29 (1.5)	72 (1.7)	28 (1.7)
Wyoming	274 (0.9)	2 (0.5)	26 (1.0)	73 (1.3)	27 (1.3)	272 (0.7)	2 (0.3)	24 (1.0)	71 (1.3)	29 (1.3)
TERRITORIES										
Guam	234 (1.0) >	1 (0.2)	7 (0.7)	30 (1.4)	70 (1.4)	232 (0.7)	1 (0.2)	5 (0.6)	27 (1.0)	73 (1.0)
Virgin Islands	222 (1.1) >	0 (0.1)	1 (0.3)	13 (1.0)	87 (1.0)	219 (0.9)	0 (0.1)	1 (0.4)	10 (1.1)	90 (1.1)

» The value for 1992 was significantly higher than the value for 1990 at about the 95 percent certainty level. « The value for 1992 was significantly lower than the value for 1990 at about the 95 percent certainty level. These notations indicate statistical significance from a multiple comparison procedure based on the 37 jurisdictions participating in both 1992 and 1990. If looking at only one state, then > and < also indicate differences that are significant. Statistically significant differences between 1990 and 1992 for the state comparison samples for the nation and regions are not indicated. (xxx) Did not participate in the 1990 Trial State Assessment.

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Overall Mathematics Performance for the States

FIGURES 1 and 3 provide a method for making appropriate comparisons in overall average mathematics proficiency across the states, the District of Columbia, and territories participating in NAEP's 1992 mathematics assessment. The jurisdictions are listed by overall average mathematics proficiency. To find out how any one jurisdiction performed in comparison to the other jurisdictions, find the name of the state or territory across the top of the chart and read down that column. As can be seen, the pattern for most states is one of having lower average proficiency than some states, about the same average proficiency as some states, and higher average proficiency than some states.

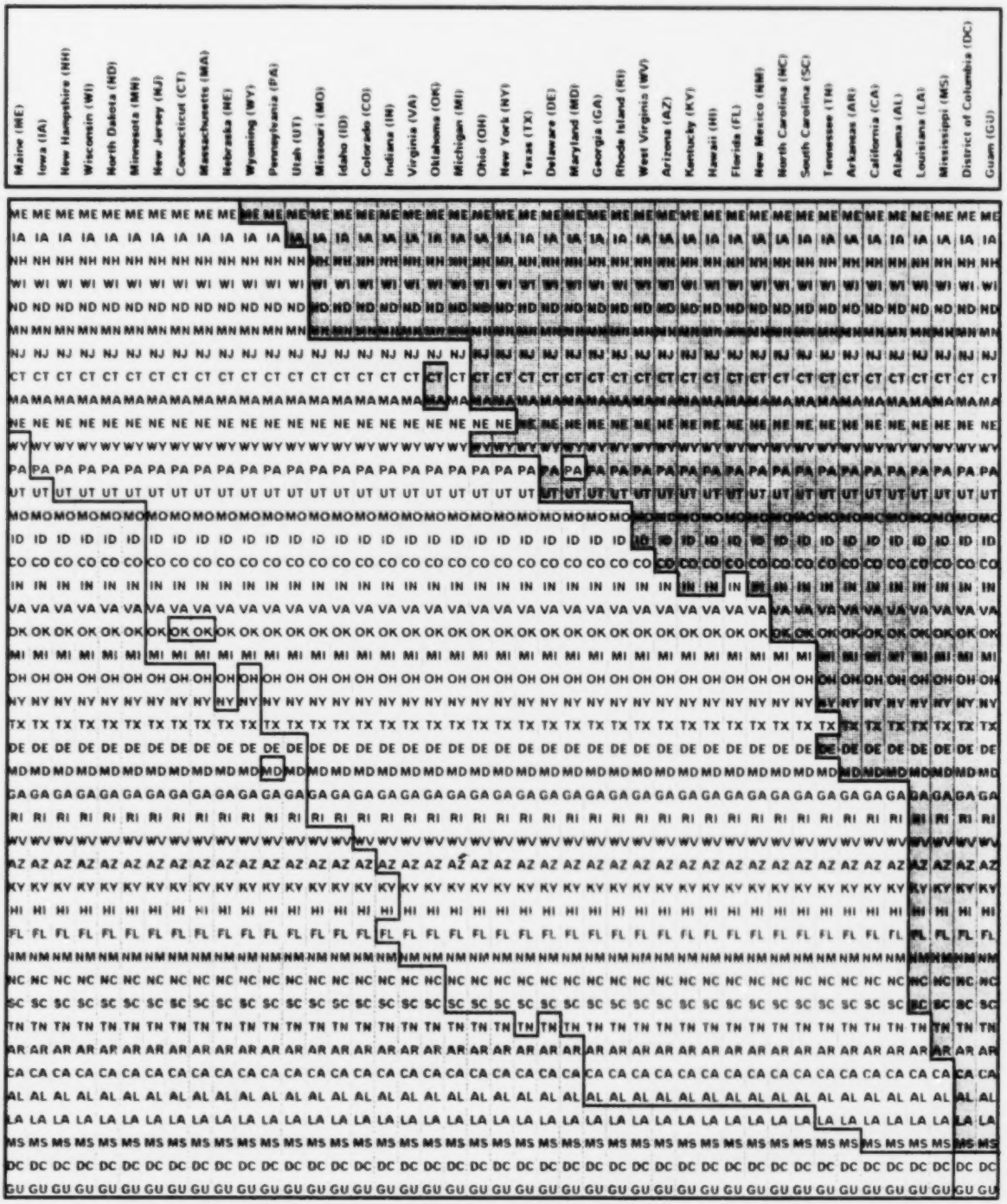
FIGURES 2 and 4 provide visual representations of percentile results for the participating jurisdictions. For example, 25 percent of the students in each state performed below the 25th percentile, and 75 percent performed above the 25th percentile. For the 90th percentile, 10 percent performed above that level and 90 percent below. The dark boxes at the midpoints of the distributions show the 95 percent confidence intervals around the average proficiencies. These intervals take into account the amount of sampling and measurement error associated with the estimates of average proficiency. The results across percentiles show great variation in students' achievement within each state, to the extent that differences within individual states across percentiles tended to exceed the differences in average performance across states.

FIGURE 5 displays the jurisdictions demonstrating increased average mathematics proficiency between 1990 and 1992. These 18 states and territories include: Arizona, Colorado, Connecticut, the District of Columbia, Hawaii, Idaho, Iowa, Kentucky, Minnesota, New Hampshire, New Mexico, North Carolina, Oklahoma, Rhode Island, Texas, Wyoming, Guam, and the Virgin Islands.

FIGURE 1 | **Comparisons of Overall Mathematics Average Proficiency 1992 Grade 4**

THE NATION'S REPORT CARD

INSTRUCTIONS: Read ***down*** the column directly under a state name listed in the heading at the top of the chart. Match the shading intensity surrounding a state postal abbreviation to the key below to determine whether the average mathematics performance of this state is higher than, the same as, or lower than the state in the column heading.



- State has statistically significantly higher average proficiency than the state listed at the top of the chart.
- No statistically significant difference from the state listed at the top of the chart.
- State has statistically significantly lower average proficiency than the state listed at the top of the chart.

The between state comparisons take into account sampling and measurement error and that each state is being compared with every other state. Significance is determined by an application of the Bonferroni procedure based on 946 comparisons by comparing the difference between the two means with four times the square root of the sum of the squared standard errors.

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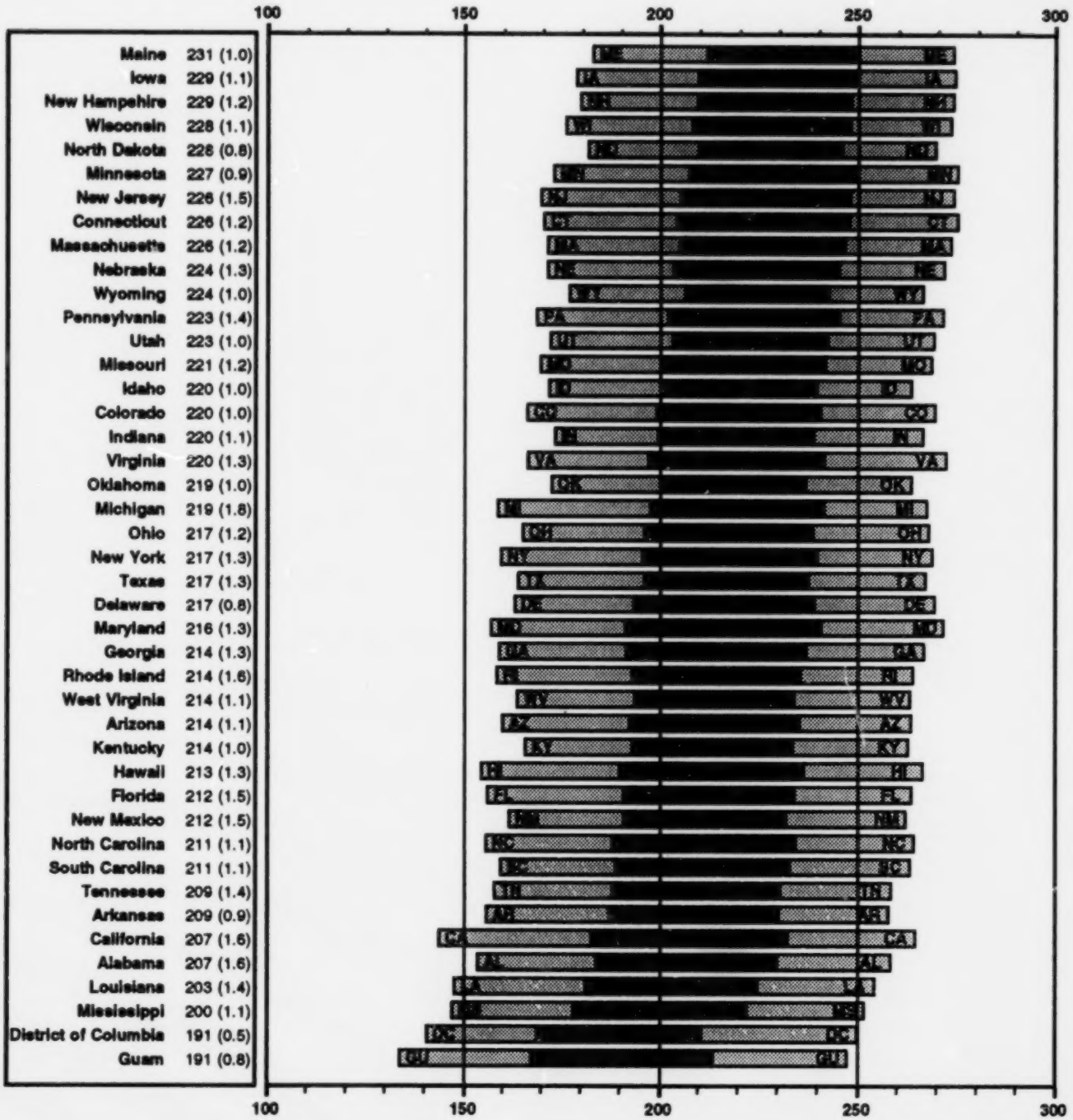
FIGURE 2

Distribution of Overall Mathematics Proficiency Organized by Average Proficiency
1992 Grade 4

THE NATION'S REPORT CARD



Percentiles of Performance

5th 25th 75th 95th

Mean and confidence interval

The center ***darkest*** box indicates a simultaneous confidence interval around the average mathematics proficiency for the state based on the Bonferroni procedure for multiple comparisons. Center boxes that do not overlap indicate significant differences between between states in average mathematics proficiency. The ***darker shaded*** boxes indicate the ranges between the 25th and 75th percentiles of the mathematics proficiency distribution, and the ***lighter shaded*** boxes the ranges between the 5th to 25th percentiles and the 75th to 95th percentiles of the distribution.

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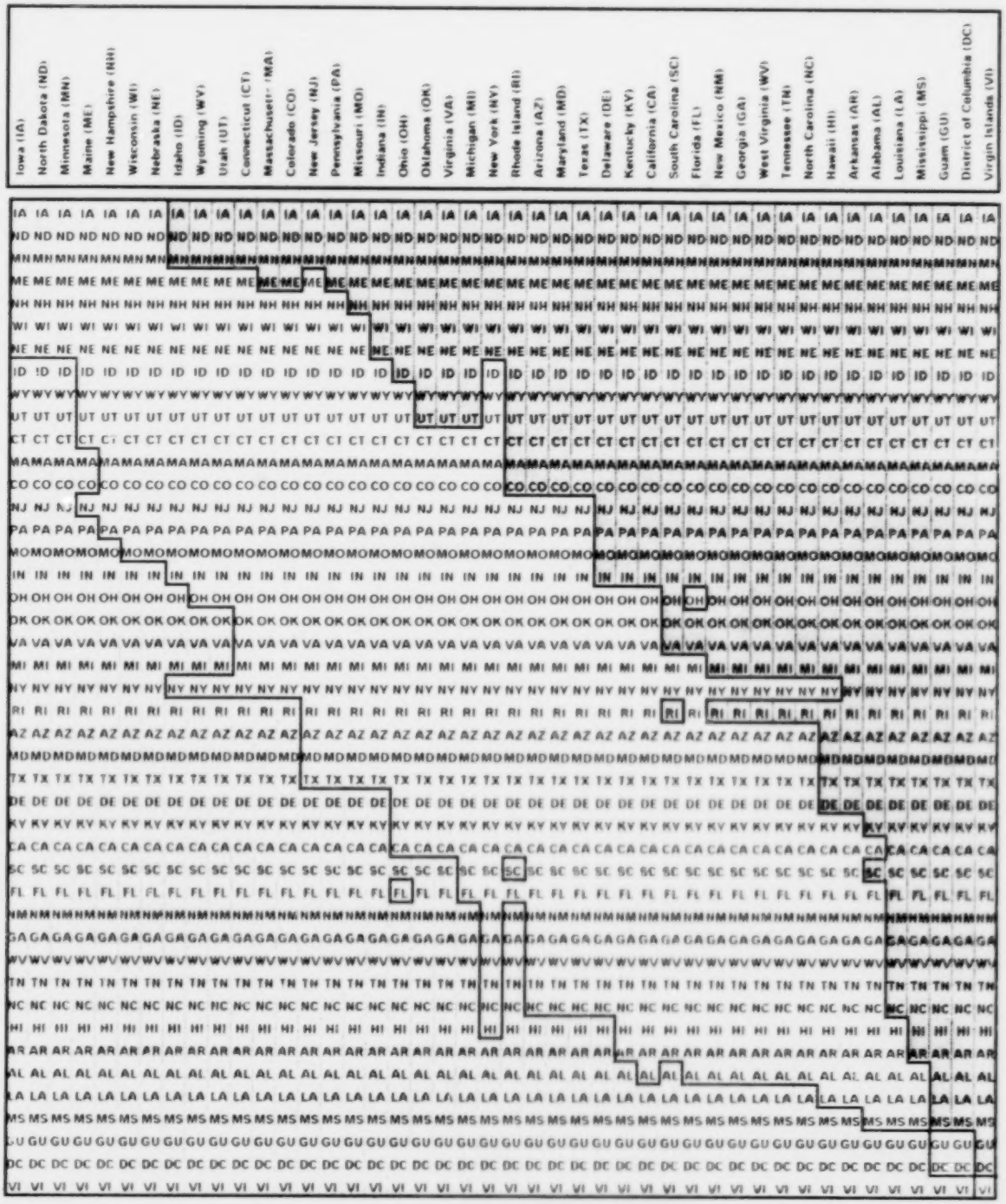
FIGURE 3

Comparisons of Overall Mathematics Average Proficiency 1992 Grade 8

THE NATION'S REPORT CARD

INSTRUCTIONS: Read ***down*** the column directly under a state name listed in the heading at the top of the chart. Match the shading intensity surrounding a state postal abbreviation to the key below to determine whether the average mathematics performance of this state is higher than, the same as, or lower than the state in the column heading.



- State has statistically significantly higher average proficiency than the state listed at the top of the chart.
- No statistically significant difference from the state listed at the top of the chart.
- State has statistically significantly lower average proficiency than the state listed at the top of the chart.

The between state comparisons take into account sampling and measurement error and that each state is being compared with every other state. Significance is determined by an application of the Bonferroni procedure based on 946 comparisons by comparing the difference between the two means with four times the square root of the sum of the squared standard errors.

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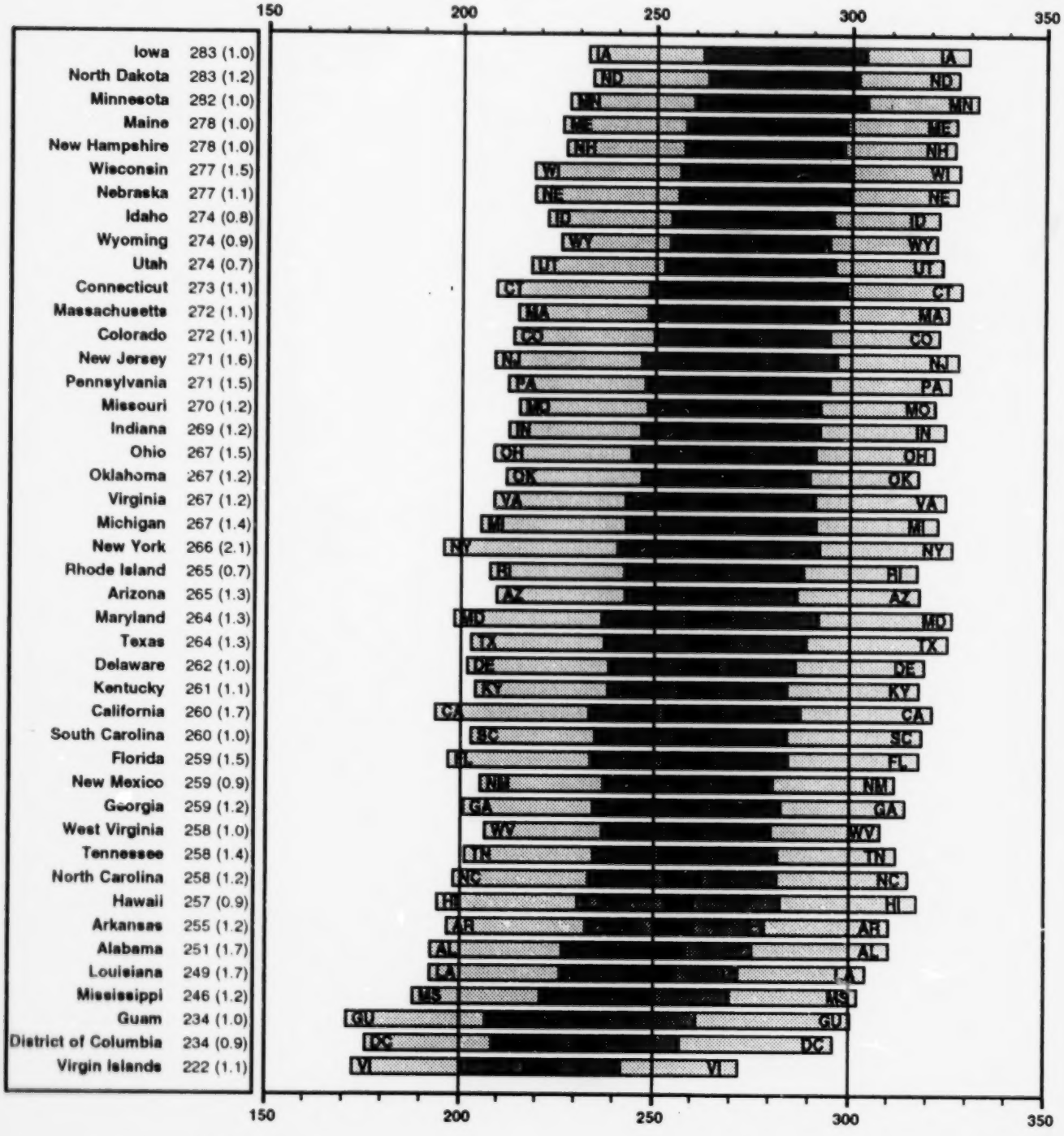
FIGURE 4

Distribution of Overall Mathematics Proficiency Organized by Average Proficiency
1992 Grade 8

THE NATION'S REPORT CARD



Percentiles of Performance

5th 25th 75th 95th

Mean and confidence interval

The center ***darkest*** box indicates a simultaneous confidence interval around the average mathematics proficiency for the state based on the Bonferroni procedure for multiple comparisons. Center boxes that do not overlap indicate significant differnces between between states in average mathematics proficiency. The ***darker shaded*** boxes indicate the ranges between the 25th and 75th percentiles of the mathematics proficiency distribution, and the ***lighter shaded*** boxes the ranges between the 5th to 25th percentiles and the 75th to 95th percentiles of the distribution.

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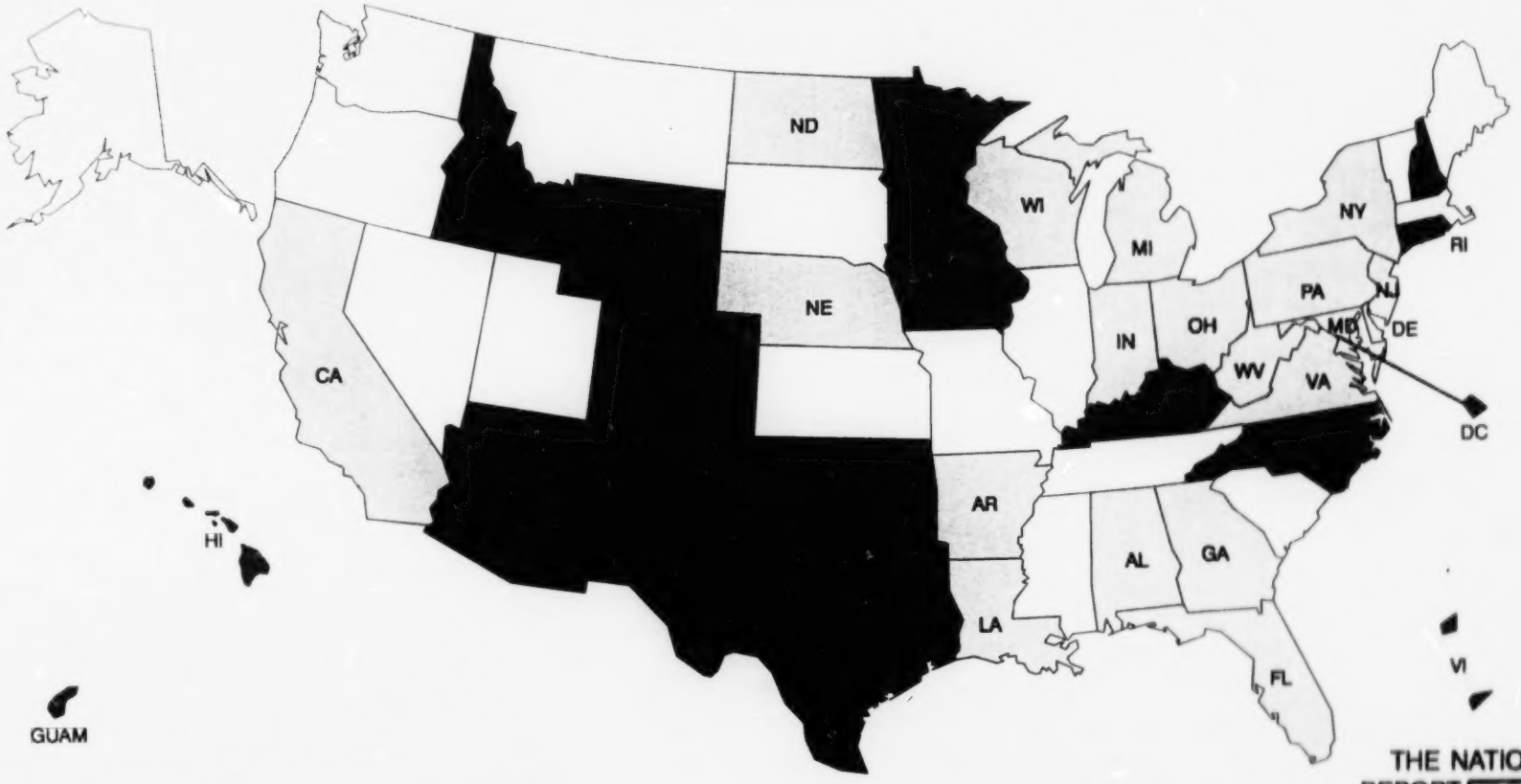
Figure 5

The NAEP Trial State Assessment

Comparisons of Overall Mathematics Proficiency at Grade 8

1992 vs. 1990



State was significantly higher in 1992 than 1990

No statistically significant difference from 1990 to 1992

State did not participate in 1990 or 1992

NOTE: No state was significantly lower in 1992 than 1990

THE NATION'S REPORT CARD

1992 Trial State Assessment

Performance for Demographic Subpopulations

TABLE 5 presents trends in national average proficiency for demographic subpopulations defined by race/ethnicity, gender, type of community, and level of parents' education. The increases between 1990 and 1992 can be seen. However, performance gaps remain between various historically advantaged and disadvantaged groups. TABLE 6 presents average proficiency by race/ethnicity and gender for the states at grades 4 and 8 as well as trends between 1990 and 1992 at grade 8.

A Graphic Illustrating Students' Average Performance Across States

FIGURE 6 is designed to highlight the gradations of mathematics proficiency across the jurisdictions that participated in the 1992 NAEP Trial State Assessment Program. The chart shows those states in the top "quintile," or top 20 percent of performance, looking in particular at the overall average proficiency demonstrated by fourth- and eighth-grade males and females and Black, Hispanic, and White students.

States having average performance in the top 20 percent across participating jurisdictions are indicated by the darkest boxes, with states in successively lower quintiles shown by progressively lighter shadings. The data for the states and territories tend to parallel those for the nation. However, there are differences. Also, in comparison to other participating jurisdictions, some states and territories have certain subpopulations that performed better than others.

For example, West Virginia is in the bottom 20 percent of states in the average mathematics proficiency of White students, but in the top 20 percent in Black students' average proficiency. At the same time, West Virginia is in the next-to-bottom 20 percent for its female students' proficiency and in the middle 20 percent for the proficiency of its male and Hispanic students.

TABLE 5 Average Mathematics Proficiency by Gender, Race/Ethnicity, Type of Community, and Region

	Assessment Years	Grade 4	Grade 8	Grade 12
Male	1992	220(0.8)>	267(1.1)>	301(1.1)>
	1990	214(1.2)	263(1.6)	297(1.4)
Female	1992	217(1.0)>	268(1.0)>	297(1.0)>
	1990	212(1.1)	262(1.3)	292(1.3)
White	1992	227(0.9)>	277(1.0)>	305(0.9)>
	1990	220(1.1)	270(1.4)	300(1.2)
Black	1992	192(1.3)	237(1.4)	275(1.7)>
	1990	189(1.8)	238(2.7)	268(1.9)
Hispanic	1992	201(1.4)	246(1.2)	283(1.8)>
	1990	198(2.0)	244(2.8)	276(2.8)
Asian/Pacific Islander	1992	231(2.4)	288(5.5)	315(3.5)
	1990	228(3.5)	279(4.8)!	311(5.2)
American Indian	1992	209(3.2)	254(2.8)	281(9.0)
	1990	208(3.9)	246(9.4)	288(10.2)!
Advantaged Urban	1992	237(2.1)	288(3.6)	316(2.6)
	1990	231(3.0)	280(3.2)	306(6.2)
Disadvantaged Urban	1992	193(2.8)	238(2.6)<	279(2.4)
	1990	195(3.0)	249(3.8)!	276(6.0)
Extreme Rural	1992	216(3.6)	267(4.6)	293(1.9)
	1990	214(4.9)	257(4.4)	293(3.3)
Other	1992	219(0.9)>	268(1.1)>	300(0.9)>
	1990	213(1.1)	262(1.7)	295(1.3)
Northeast	1992	223(2.0)>	269(2.7)	302(1.5)
	1990	215(2.9)	270(2.8)	300(2.3)
Southeast	1992	210(1.6)>	260(1.4)	291(1.4)>
	1990	205(2.1)	255(2.5)	284(2.2)
Central	1992	223(1.9)>	274(1.9)>	303(1.8)
	1990	216(1.7)	266(2.3)	297(2.6)
West	1992	218(1.5)	268(2.0)>	298(1.7)
	1990	216(2.4)	261(2.6)	294(2.6)

>The value for 1992 was significantly higher than the value for 1990 at about the 95 percent confidence level. < The value for 1992 was significantly lower than the value for 1990 at about the 95 percent confidence level. ! Interpret with caution -- the nature of the sample does not allow accurate determination of the variability of this estimated statistic. The standard errors of the estimated proficiencies appear in parentheses. It can be said with 95 percent confidence for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample. In comparing two estimates, one must use the standard error of the difference (see Appendix for details).

TABLE 6 | **Average Mathematics Proficiency by Gender and Race/Ethnicity**

PUBLIC SCHOOLS	Grade 4 - 1992						
	Gender		Race/Ethnicity				
	Male	Female	White	Black	Hispanic	Asian / Pacific Islander	American Indian
	Average Proficiency	Average Proficiency	Average Proficiency	Average Proficiency	Average Proficiency	Average Proficiency	Average Proficiency
NATION	218 (0.9)	216 (1.1)	226 (1.0)	191 (1.4)	199 (1.5)	232 (2.6)	208 (3.5)
Northeast	225 (2.3)	220 (2.9)	232 (2.4)	194 (3.1)	200 (3.2)	*** (***)	*** (***)
Southeast	209 (1.6)	209 (2.7)	219 (2.2)	190 (2.0)	198 (3.4)	*** (***)	*** (***)
Central	224 (2.6)	220 (2.5)	228 (1.8)	192 (4.3)	198 (3.3)	*** (***)	*** (***)
West	217 (1.7)	217 (1.9)	225 (1.8)	188 (2.7)	200 (2.0)	232 (3.2)	*** (***)
STATES							
Alabama	207 (1.8)	207 (1.7)	218 (1.6)	187 (1.1)	192 (4.0)	*** (***)	*** (***)
Arizona	213 (1.3)	214 (1.2)	225 (0.8)	198 (3.6)	202 (1.3)	*** (***)	191 (3.5)
Arkansas	209 (1.1)	208 (1.1)	217 (1.0)	187 (1.7)	193 (2.9)	*** (***)	210 (3.7)
California	208 (1.9)	207 (1.7)	220 (1.8)	182 (3.3)	190 (1.6)	223 (2.7)	207 (6.7)
Colorado	221 (1.2)	219 (1.2)	227 (1.1)	199 (2.9)	205 (1.5)	222 (4.4)	214 (4.5)
Connecticut	227 (1.3)	224 (1.3)	234 (0.9)	193 (2.7)	204 (2.8)	*** (***)	*** (***)
Delaware	218 (1.3)	215 (1.2)	226 (0.9)	196 (1.4)	197 (2.6)	*** (***)	*** (***)
Dist. Columbia	192 (1.0)	191 (0.9)	241 (4.2)	189 (0.7)	181 (2.3)	*** (***)	*** (***)
Florida	214 (1.8)	211 (1.7)	223 (1.4)	189 (2.0)	205 (2.5)	*** (***)	*** (***)
Georgia	214 (1.7)	215 (1.3)	228 (1.2)	195 (1.4)	196 (2.7)	*** (***)	*** (***)
Hawaii	211 (1.7)	214 (1.2)	218 (1.8)	198 (3.3)	197 (2.6)	215 (1.6)	*** (***)
Idaho	222 (1.2)	219 (1.1)	223 (1.0)	*** (***)	202 (2.4)	*** (***)	212 (3.0)
Indiana	221 (1.4)	218 (1.1)	224 (0.9)	194 (2.4)	208 (2.0)	*** (***)	*** (***)
Iowa	229 (1.2)	228 (1.3)	231 (1.0)	193 (3.9)!	218 (2.6)	*** (***)	*** (***)
Kentucky	214 (1.3)	214 (1.1)	216 (1.0)	200 (2.5)	197 (3.0)	*** (***)	*** (***)
Louisiana	203 (1.7)	202 (1.5)	217 (1.5)	186 (1.7)	199 (4.3)	*** (***)	*** (***)
Maine	231 (1.3)	230 (1.3)	232 (1.1)	*** (***)	218 (3.6)	*** (***)	*** (***)
Maryland	218 (1.5)	214 (1.6)	228 (1.2)	193 (1.9)	205 (3.6)	235 (3.8)	*** (***)
Massachusetts	227 (1.4)	224 (1.4)	231 (1.0)	192 (3.1)	205 (2.7)	228 (8.0)	*** (***)
Michigan	221 (1.9)	216 (2.0)	227 (1.5)	184 (3.9)	204 (2.6)	*** (***)	210 (4.0)
Minnesota	228 (1.1)	227 (1.2)	231 (0.9)	192 (3.1)	206 (2.9)	*** (***)	*** (***)
Mississippi	199 (1.3)	201 (1.2)	217 (1.3)	188 (1.3)	184 (2.9)	*** (***)	*** (***)
Missouri	221 (1.5)	221 (1.3)	227 (1.1)	194 (2.2)	206 (3.2)	*** (***)	*** (***)
Nebraska	226 (1.4)	223 (1.6)	228 (1.2)	188 (2.5)	209 (3.2)	*** (***)	*** (***)
New Hampshire	229 (1.5)	228 (1.3)	230 (1.1)	*** (***)	214 (2.7)	*** (***)	*** (***)
New Jersey	227 (1.7)	225 (1.6)	236 (1.3)	197 (2.6)	205 (2.6)	240 (3.0)	*** (***)
New Mexico	212 (1.7)	212 (1.5)	224 (1.5)	201 (3.9)	202 (1.5)	*** (***)	206 (2.9)!
New York	221 (1.3)	214 (1.5)	228 (1.4)	198 (2.7)	198 (2.3)	235 (4.4)!	*** (***)
North Carolina	211 (1.2)	212 (1.3)	222 (1.1)	191 (1.3)	198 (4.2)	*** (***)	202 (4.9)!
North Dakota	229 (1.0)	226 (1.0)	229 (0.8)	*** (***)	213 (3.6)	*** (***)	211 (3.2)!
Ohio	219 (1.2)	216 (1.5)	221 (1.1)	193 (3.0)	206 (3.3)	*** (***)	216 (4.2)
Oklahoma	220 (1.1)	218 (1.3)	223 (1.0)	200 (2.6)	208 (2.5)	*** (***)	211 (2.0)
Pennsylvania	224 (1.6)	222 (1.6)	230 (1.2)	192 (2.5)	203 (2.3)	*** (***)	*** (***)
Rhode Island	215 (1.9)	213 (1.6)	221 (1.3)	189 (3.4)	188 (2.8)	191 (4.3)	*** (***)
South Carolina	211 (1.4)	211 (1.1)	224 (1.2)	193 (1.1)	198 (2.7)	*** (***)	*** (***)
Tennessee	209 (1.5)	210 (1.5)	217 (1.2)	191 (1.9)	191 (4.2)	*** (***)	*** (***)
Texas	218 (1.5)	216 (1.4)	228 (1.7)	197 (2.0)	207 (1.9)	234 (4.5)	*** (***)
Utah	223 (1.2)	223 (1.2)	225 (1.0)	*** (***)	208 (2.2)	*** (***)	*** (***)
Virginia	221 (1.6)	218 (1.4)	228 (1.5)	196 (1.5)	211 (3.4)	236 (4.6)	*** (***)
West Virginia	215 (1.5)	213 (1.1)	215 (1.0)	202 (4.4)	202 (3.0)	*** (***)	*** (***)
Wisconsin	229 (1.4)	226 (1.2)	233 (0.9)	194 (2.9)	211 (3.0)	*** (***)	206 (8.0)!
Wyoming	226 (1.2)	223 (1.1)	227 (0.9)	*** (***)	214 (1.8)	*** (***)	211 (4.0)!
TERRITORY							
Guam	189 (1.3)	184 (1.1)	205 (2.0)	183 (5.4)	179 (2.1)	193 (1.2)	*** (***)

The standard errors of the estimated proficiencies appear in parentheses. It can be said with 95 percent certainty that for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample. The percentages for race ethnicity may not add to 100 percent because some students categorized themselves as "other." ***Sample size insufficient to permit reliable estimate. There were fewer than 62 students. ! Interpret with caution - the nature of the sample does not allow accurate determination of the variability of this estimated statistic.

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TABLE 6 | **Average Mathematics Proficiency by Gender and Race/Ethnicity (continued)**

PUBLIC SCHOOLS	Grade 8 - 1992						
	Gender		Race/Ethnicity				
	Male	Female	White	Black	Hispanic	Asian / Pacific Islander	American Indian
	Average Proficiency	Average Proficiency	Average Proficiency	Average Proficiency	Average Proficiency	Average Proficiency	Average Proficiency
NATION	266 (1.2)	267 (1.2)	276 (1.1)	236 (1.3)	245 (1.3)	287 (6.6)	254 (2.9)
Northeast	267 (2.9)	267 (3.6)	279 (3.3)	239 (3.8)	241 (3.8)‹	*** (***)	*** (***)
Southeast	257 (1.6)	259 (1.4)	269 (1.2)	233 (1.7)	240 (2.8)‹	*** (***)	*** (***)
Central	272 (2.9)	274 (2.4)	280 (2.0)	239 (3.5)	246 (4.2)	*** (***)	*** (***)
West	266 (2.7)	268 (2.2)	277 (2.4)	234 (3.5)	246 (1.6)	286(11.3)	*** (***)
STATES							
Alabama	253 (1.8)	250 (1.9)	264 (1.4)	231 (2.2)	220 (5.3)	*** (***)	*** (***)
Arizona	265 (1.4)	264 (1.4)	275 (1.1)	251 (3.4)	247 (2.7)	*** (***)	251 (2.7)
Arkansas	256 (1.4)	255 (1.3)	265 (1.0)	230 (1.9)	228 (4.1)	*** (***)	*** (***)
California	259 (1.9)	26[illegible] 1.9)	276 (1.9)	233 (3.6)	240 (2.0)	276 (2.9)	*** (***)
Colorado	273 (1.2)	27[illegible] (1.3)	278 (1.0)	241 (4.4)	254 (1.7)	*** (***)	*** (***)
Connecticut	274 (1.4)	272 (1.3)	283 (0.9)	242 (2.9)	241 (2.4)	287 (8.0)	*** (***)
Delaware	263 (1.4)	261 (1.3)	272 (1.0)	241 (1.8)	239 (3.4)	*** (***)	*** (***)
Dist. Columbia	233 (1.2)	235 (1.4)	*** (***)	233 (0.9)	225 (3.8)	*** (***)	*** (***)
Florida	259 (1.5)	259 (1.8)	273 (1.3)	236 (2.3)	245 (2.5)	*** (***)	*** (***)
Georgia	260 (1.5)	257 (1.2)	270 (1.3)	241 (1.3)	233 (5.5)	*** (***)	*** (***)
Hawaii	254 (1.1)	260 (1.2)	265 (1.6)	*** (***)	238 (2.2)	259 (1.1)	*** (***)
Idaho	276 (1.1)	272 (0.9)	277 (0.8)	*** (***)	253 (2.3)	*** (***)	259 (4.2)
Indiana	272 (1.4)	267 (1.3)	273 (1.2)	243 (2.6)	249 (4.6)	*** (***)	*** (***)
Iowa	284 (1.2)	282 (1.3)	284 (1.0)	*** (***)	261 (3.8)	*** (***)	*** (***)
Kentucky	263 (1.4)	260 (1.4)	264 (1.1)	241 (2.6)	231 (4.6)	*** (***)	*** (***)
Louisiana	251 (1.6)	247 (2.0)	263 (1.7)	232 (2.2)	228 (3.5)	*** (***)	*** (***)
Maine	278 (1.3)	278 (1.2)	279 (1.0)	*** (***)	*** (***)	*** (***)	261 (4.5)
Maryland	265 (1.6)	263 (1.6)	278 (1.5)	239 (2.0)	240 (3.3)	287 (4.7)	*** (***)
Massachusetts	273 (1.5)	271 (1.2)	277 (1.1)	243 (5.0)	240 (3.4)	*** (***)	*** (***)
Michigan	269 (1.6)	264 (1.5)	276 (1.5)	232 (1.8)	248 (4.0)	*** (***)	*** (***)
Minnesota	282 (1.4)	282 (1.1)	284 (1.0)	*** (***)	253 (3.8)	*** (***)	*** (***)
Mississippi	247 (1.6)	244 (1.4)	262 (1.4)	230 (1.4)	223 (3.1)	*** (***)	*** (***)
Missouri	272 (1.5)	269 (1.4)	275 (1.0)	241 (2.9)	251 (4.2)	*** (***)	*** (***)
Nebraska	278 (1.3)	276 (1.4)	281 (1.1)	236 (4.7)	254 (3.1)	*** (***)	*** (***)
New Hampshire	278 (1.3)	277 (1.2)	278 (0.9)	*** (***)	258 (5.1)	*** (***)	*** (***)
New Jersey	275 (1.6)	268 (1.7)	283 (1.4)	242 (2.7)	247 (3.5)	297 (3.3)	*** (***)
New Mexico	261 (1.4)	257 (1.0)	272 (1.2)	*** (***)	248 (1.1)	*** (***)	249 (3.0)
New York	267 (2.4)	265 (2.3)	279 (1.1)	232 (4.5)	243 (4.8)	281 (6.8)	*** (***)
North Carolina	259 (1.4)	257 (1.4)	266 (1.0)	238 (1.7)	238 (4.7)	*** (***)	*** (***)
North Dakota	284 (1.3)	281 (1.4)	284 (1.2)	*** (***)	*** (***)	*** (***)	261 (4.3)‹
Ohio	269 (1.8)	266 (1.8)	274 (1.4)	234 (2.3)	245 (4.6)	*** (***)	*** (***)
Oklahoma	269 (1.2)	266 (1.6)	272 (1.0)	238 (3.0)	252 (3.2)	*** (***)	261 (3.2)
Pennsylvania	273 (1.6)	268 (1.7)	276 (1.1)	237 (4.6)	246 (3.9)‹	*** (***)	*** (***)
Rhode Island	265 (1.0)	265 (1.0)	271 (0.9)	240 (2.9)	232 (2.7)	264 (3.4)	*** (***)
South Carolina	260 (1.4)	260 (1.0)	273 (1.1)	241 (1.0)	233 (2.6)	*** (***)	*** (***)
Tennessee	260 (1.7)	256 (1.5)	266 (1.1)	234 (2.4)	227 (4.8)	*** (***)	*** (***)
Texas	266 (1.4)	261 (1.6)	279 (1.6)	243 (2.0)	248 (1.2)	301 (4.9)	*** (***)
Utah	275 (1.0)	272 (1.0)	276 (0.8)	*** (***)	253 (2.3)	*** (***)	*** (***)
Virginia	268 (1.6)	267 (1.2)	275 (1.1)	244 (1.9)	254 (4.0)	280 (4.0)	*** (***)
West Virginia	259 (1.1)	258 (1.2)	260 (1.0)	243 (3.7)	230 (4.9)	*** (***)	*** (***)
Wisconsin	278 (1.8)	277 (1.6)	282 (1.2)	246 (6.8)	246 (4.0)	*** (***)	261 (6.0)‹
Wyoming	274 (1.1)	275 (1.2)	277 (0.8)	*** (***)	257 (2.1)	*** (***)	250 (2.4)‹
TERRITORIES							
Guam	232 (1.4)	237 (1.5)	266 (5.4)	*** (***)	218 (2.8)	236 (1.1)	*** (***)
Virgin Islands	221 (1.5)	222 (1.4)	*** (***)	224 (1.2)	213 (1.9)	*** (***)	*** (***)

The percentages for race ethnicity may not add to 100 percent because some students categorized themselves as "other." »The value for 1992 was significantly higher than the value for 1990 at about the 95 percent certainty level. «The value for 1992 was significantly lower than the value for 1990 at about the 95 percent certainty level. These notations indicate statistical significance from a multiple comparison procedure based on the 37 jurisdictions participating in both 1992 and 1990. If looking at only one state, then > and < also indicate differences that are significant. Statistically significant differences between 1990 and 1992 for the state comparison samples for the nation and regions are not indicated.

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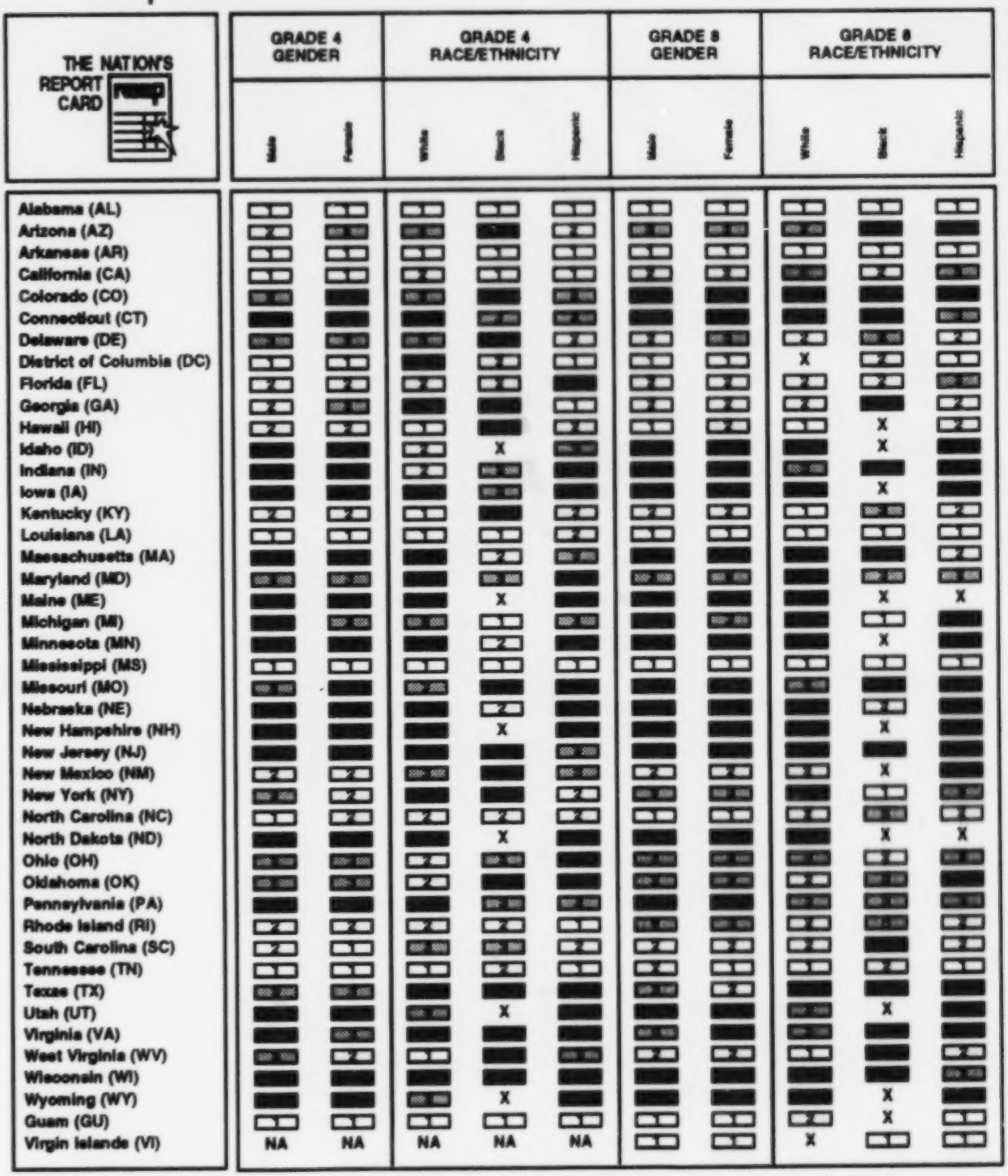
FIGURE 6

Average Mathematics Proficiency by Gender and Race/Ethnicity for Five Performance Bands (Quintiles) 1992 Grades 4 and 8



Quintiles of Performance

bottom 20 percent — top 20 percent

1st 2nd 3rd 4th 5th

lower ← proficiency → higher

States categorized in the bottom 20 percent of performance have average mathematics proficiencies in the lowest fifth of the average mathematics proficiency distribution of all states and are indicated by the number 1 (first quintile). States with average proficiencies in the top 20 percent of the distribution are indicated by the number 5 (fifth quintile). The numbers 2, 3, and 4 indicate states with average proficiencies in the second, third, and fourth fifths of the distribution.

X Sample size too small (fewer than 62 students) to permit reliable reporting of performance bands (quintiles).

NA Grade 4 data for the Virgin Islands are not available.

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What Students Know and Can Do in Mathematics

In contrast to the achievement-level results, based on judgments of how much students *should* know or be able to do, NAEP anchor level results provide descriptions of the types of knowledge, mathematical abilities, and problem-solving skills that students display at particular intervals along NAEP's 0 to 500 point scale. More specifically, the empirically based descriptions are based on what students know and can do at one level that differentiates them from students performing at lower levels. The anchor-level results for the nation as well as for states and territories are shown in TABLES 7 and 8.

Although most students at all three grades demonstrated some success in solving problems involving addition and subtraction, performance began to drop off as the problems required multiplication and division or reasoning in situations involving more than one step or operation. It was estimated that

TABLE 7 National Overall Average Mathematics Proficiency and Anchor Levels, Grades 4, 8, and 12

		Assessment Years	Grade 4	Grade 8	Grade 12
Average Proficiency		1992	218(0.7)>	268(0.9)>	299(0.9)>
		1990	213(0.9)	263(1.3)	294(1.1)
Level	Description		Percentage of Students at or Above		
200	Addition and Subtraction, and Simple Problem Solving with Whole Numbers	1992	72(0.9)>	97(0.4)	100(0.1)
		1990	67(1.4)	95(0.7)	100(0.2)
250	Multiplication and Division, Simple Measurement, and Two-Step Problem Solving	1992	17(0.8)>	68(1.0)	91(0.5)>
		1990	12(1.1)	65(1.4)	88(0.9)
300	Reasoning and Problem Solving Involving Fractions, Decimals, Percents, and Elementary Concepts in Geometry, Statistics, and Algebra	1992	0(0.1)	20(0.9)>	50(1.2)>
		1990	0(0.1)	15(1.0)	45(1.4)
350	Reasoning and Problem Solving Involving Geometric Relationships, Algebra, and Functions	1992	0(0.0)	1(0.2)	6(0.5)
		1990	0(0.0)	0(0.2)	5(0.8)

> The value for 1992 was significantly higher than the value for 1990 at about the 95 percent confidence level. < The value for 1992 was significantly lower than the value for 1990 at about the 95 percent confidence level. The standard errors of the estimated percentages and proficiencies appear in parentheses. It can be said with 95 percent certainty that for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample. When the proportion of students is either 0 percent or 100 percent, the standard error is inestimable. However, percentages 99.5 percent and greater were rounded to 100 percent and percentages 0.5 percent or less were rounded to 0 percent.

TABLE 8 | **Overall Average Mathematics Proficiency and Anchor Levels**

PUBLIC SCHOOLS	Grade 4 - 1992				
	Average Proficiency	Percentage of Students At or Above Level 200	Percentage of Students At or Above Level 250	Percentage of Students At or Above Level 300	Percentage of Students At or Above Level 350
NATION	217 (0.8)	71 (1.0)	16 (0.9)	0 (0.1)	0 (0.0)
Northeast	223 (2.1)	75 (2.5)	22 (2.7)	1 (0.3)	0 (0.0)
Southeast	209 (1.9)	61 (2.4)	10 (1.6)	0 (0.2)	0 (0.0)
Central	222 (2.2)	77 (2.9)	19 (2.0)	0 (0.1)	0 (0.0)
West	217 (1.6)	70 (1.9)	15 (2.0)	0 (0.3)	0 (0.0)
STATES					
Alabama	207 (1.6)	58 (2.1)	9 (1.1)	0 (0.0)	0 (0.0)
Arizona	214 (1.1)	68 (1.5)	12 (0.9)	0 (0.1)	0 (0.0)
Arkansas	209 (0.9)	62 (1.4)	9 (0.7)	0 (0.0)	0 (0.0)
California	207 (1.6)	60 (2.0)	11 (1.1)	0 (0.1)	0 (0.0)
Colorado	220 (1.0)	75 (1.2)	17 (1.0)	0 (0.1)	0 (0.0)
Connecticut	226 (1.2)	79 (1.3)	23 (1.4)	1 (0.3)	0 (0.0)
Delaware	217 (0.8)	69 (1.2)	15 (1.0)	0 (0.1)	0 (0.0)
Dist. Columbia	191 (0.5)	37 (1.5)	5 (0.3)	0 (0.1)	0 (0.0)
Florida	212 (1.5)	66 (1.9)	12 (1.2)	0 (0.2)	0 (0.0)
Georgia	214 (1.3)	67 (1.6)	14 (1.1)	0 (0.1)	0 (0.0)
Hawaii	213 (1.3)	65 (1.6)	14 (0.9)	0 (0.1)	0 (0.0)
Idaho	220 (1.0)	77 (1.6)	14 (1.0)	0 (0.1)	0 (0.0)
Indiana	220 (1.1)	75 (1.4)	14 (1.0)	0 (0.1)	0 (0.0)
Iowa	229 (1.1)	84 (1.1)	24 (1.1)	0 (0.1)	0 (0.0)
Kentucky	214 (1.0)	67 (1.4)	12 (1.0)	0 (0.1)	0 (0.0)
Louisiana	203 (1.4)	54 (1.9)	7 (0.8)	0 (0.1)	0 (0.0)
Maine	231 (1.0)	86 (1.0)	26 (1.5)	1 (0.2)	0 (0.0)
Maryland	216 (1.3)	67 (1.5)	17 (1.2)	0 (0.2)	0 (0.0)
Massachusetts	226 (1.2)	80 (1.1)	22 (1.4)	0 (0.2)	0 (0.0)
Michigan	219 (1.8)	73 (2.0)	17 (1.6)	0 (0.2)	0 (0.0)
Minnesota	227 (0.9)	81 (1.2)	24 (1.1)	0 (0.1)	0 (0.0)
Mississippi	200 (1.1)	50 (1.6)	6 (0.6)	0 (0.1)	0 (0.0)
Missouri	221 (1.2)	76 (1.5)	17 (1.2)	0 (0.1)	0 (0.0)
Nebraska	224 (1.3)	78 (1.5)	20 (1.6)	0 (0.2)	0 (0.0)
New Hampshire	229 (1.2)	84 (1.2)	23 (1.6)	0 (0.2)	0 (0.0)
New Jersey	226 (1.5)	80 (1.8)	23 (1.6)	0 (0.2)	0 (0.0)
New Mexico	212 (1.5)	65 (2.1)	10 (1.3)	0 (0.1)	0 (0.0)
New York	217 (1.3)	71 (1.5)	16 (1.3)	0 (0.2)	0 (0.0)
North Carolina	211 (1.1)	64 (1.6)	12 (0.8)	0 (0.1)	0 (0.0)
North Dakota	228 (0.8)	85 (0.9)	21 (1.1)	0 (0.1)	0 (0.0)
Ohio	217 (1.2)	71 (1.5)	15 (1.1)	0 (0.1)	0 (0.0)
Oklahoma	219 (1.0)	76 (1.5)	13 (1.0)	0 (0.1)	0 (0.0)
Pennsylvania	223 (1.4)	77 (1.5)	20 (1.4)	0 (0.2)	0 (0.0)
Rhode Island	214 (1.6)	68 (1.8)	12 (1.1)	0 (0.1)	0 (0.0)
South Carolina	211 (1.1)	63 (1.3)	12 (1.1)	0 (0.1)	0 (0.0)
Tennessee	209 (1.4)	63 (1.9)	9 (1.0)	0 (0.1)	0 (0.0)
Texas	217 (1.3)	71 (1.8)	14 (1.2)	0 (0.1)	0 (0.0)
Utah	223 (1.0)	79 (1.2)	18 (1.0)	0 (0.1)	0 (0.0)
Virginia	220 (1.3)	73 (1.5)	18 (1.6)	1 (0.3)	0 (0.0)
West Virginia	214 (1.1)	68 (1.6)	11 (0.9)	0 (0.1)	0 (0.0)
Wisconsin	228 (1.1)	83 (1.2)	23 (1.4)	0 (0.2)	0 (0.0)
Wyoming	224 (1.0)	82 (1.2)	17 (1.2)	0 (0.1)	0 (0.0)
TERRITORY					
Guam	191 (0.8)	40 (1.2)	4 (0.5)	0 (0.0)	0 (0.0)

The standard errors of the estimated percentages and proficiencies appear in parentheses. It can be said with 95 percent certainty that for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample. When the proportion of students is either 0 percent or 100 percent, the standard error is inestimable. However, percentages 99.5 percent and greater were rounded to 100 percent and percentages less than 0.5 percent were rounded to 0 percent.

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TABLE 8 | **Overall Average Mathematics Proficiency and Anchor Levels (continued)**

PUBLIC SCHOOLS	Grade 8 - 1992					Grade 8 - 1990				
	Average Proficiency	Percentage of Students At or Above Level 200	Percentage of Students At or Above Level 250	Percentage of Students At or Above Level 300	Percentage of Students At or Above Level 350	Average Proficiency	Percentage of Students At or Above Level 200	Percentage of Students At or Above Level 250	Percentage of Students At or Above Level 300	Percentage of Students At or Above Level 350
NATION	266 (1.0)	96 (0.4)	67 (1.1)	18 (0.9)	1 (0.2)	262 (1.4)	95 (0.7)	64 (1.4)	15 (1.1)	1 (0.3)
Northeast	267 (3.0)	96 (0.9)	65 (3.7)	21 (2.3)	1 (0.5)	270 (3.3)	97 (1.0)	72 (3.8)	20 (3.2)	1 (0.5)
Southeast	258 (1.2)	95 (1.0)	58 (1.6)	12 (1.1)	0 (0.1)	254 (2.6)	93 (2.0)	55 (2.9)	11 (2.1)	0 (0.3)
Central	273 (2.2)	98 (0.6)	75 (2.4)	22 (2.6)	1 (0.3)	265 (2.3)	96 (1.3)	68 (2.8)	14 (1.5)	0 (0.4)
West	267 (2.1)	96 (0.6)	68 (2.3)	19 (1.8)	1 (0.4)	261 (2.6)	94 (1.4)	62 (2.5)	14 (2.1)	1 (0.4)
STATES										
Alabama	251 (1.7)	93 (1.2)	51 (2.0)	9 (0.9)	- 0 (0:1)	253 (1.1)	94 (0.7)	53 (1.5)	9 (0.6)	0 (0.1)
Arizona	265 (1.3) >	97 (0.4)	68 (1.7)	14 (1.1)	0 (0.1)	260 (1.3)	95 (0.7)	62 (1.8)	12 (0.9)	0 (0.2)
Arkansas	255 (1.2)	94 (0.7)	58 (1.6)	9 (0.9)	0 (0.1)	256 (0.9)	95 (0.6)	58 (1.3)	9 (0.7)	0 (0.1)
California	260 (1.7)	93 (0.8)	61 (2.0)	15 (1.3)	1 (0.3)	256 (1.3)	93 (0.6)	57 (1.5)	12 (1.2)	0 (0.2)
Colorado	272 (1.1) >	98 (0.4)	75 (1.2) >	20 (1.1) >	0 (0.2)	267 (0.9)	97 (0.4)	71 (1.1)	16 (1.0)	0 (0.1)
Connecticut	273 (1.1) >	97 (0.7)	74 (1.3)	24 (1.0)	1 (0.1)	270 (1.0)	97 (0.5)	72 (1.3)	21 (1.0)	1 (0.2)
Delaware	262 (1.0)	96 (0.8)	64 (1.3)	14 (0.9)	1 (0.2)	261 (0.9)	95 (0.7)	61 (1.2)	14 (0.8)	1 (0.3)
Dist. Columbia	234 (0.9) <	82 (1.0)	32 (1.3) <	4 (0.9)	0 (0.2)	231 (0.9)	83 (1.1)	26 (1.1)	3 (0.5)	0 (0.2)
Florida	259 (1.5)	94 (0.8)	61 (1.8)	14 (1.1)	0 (0.2)	255 (1.3)	93 (0.7)	56 (1.5)	11 (0.9)	0 (0.1)
Georgia	259 (1.2)	95 (0.6)	60 (1.5)	12 (0.9)	0 (0.2)	259 (1.3)	95 (0.6)	60 (1.4)	13 (1.1)	1 (0.4)
Hawaii	257 (0.9) »	93 (0.7) <	57 (1.2) »	13 (0.7)	0 (0.2)	251 (0.8)	90 (0.7)	51 (1.1)	11 (0.7)	1 (0.1)
Idaho	274 (0.8) >	99 (0.3)	80 (1.0)	20 (1.1)	0 (0.1)	271 (0.8)	99 (0.4)	77 (1.2)	17 (1.1)	0 (0.1)
Indiana	269 (1.2)	98 (0.5)	72 (1.3)	19 (1.2)	1 (0.3)	267 (1.1)	98 (0.4)	70 (1.5)	16 (1.1)	1 (0.2)
Iowa	283 (1.0) »	100 (0.2)	86 (1.1) >	29 (1.3) >	1 (0.3)	278 (1.1)	99 (0.3)	81 (1.1)	24 (1.4)	1 (0.2)
Kentucky	261 (1.1) >	96 (0.6)	64 (1.3) >	13 (1.0)	0 (0.2)	257 (1.2)	96 (0.6)	58 (1.7)	10 (0.8)	0 (0.1)
Louisiana	249 (1.7)	92 (0.9)	50 (1.9)	7 (1.0)	0 (0.1)	246 (1.2)	92 (0.8)	46 (1.8)	5 (0.5)	0 (0.1)
Maine	278 (1.0)	99 (0.4)	83 (1.2)	24 (1.4)	1 (0.2)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Maryland	264 (1.3)	95 (0.7)	64 (1.4)	19 (1.2)	1 (0.4)	261 (1.4)	94 (0.7)	61 (1.7)	16 (1.2)	1 (0.2)
Massachusetts	272 (1.1)	98 (0.5)	74 (1.5)	22 (1.3)	1 (0.2)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Michigan	267 (1.4)	96 (0.5)	69 (1.5)	18 (1.4)	0 (0.2)	264 (1.2)	97 (0.5)	67 (1.3)	15 (1.1)	1 (0.2)
Minnesota	282 (1.0) »	99 (0.2)	83 (1.1) >	29 (1.2) »	1 (0.3)	275 (0.9)	98 (0.4)	79 (1.0)	22 (1.2)	1 (0.3)
Mississippi	246 (1.2)	90 (0.8)	45 (1.4)	6 (0.7)	0 (0.0)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Missouri	270 (1.2)	98 (0.5)	74 (1.6)	18 (1.3)	0 (0.2)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Nebraska	277 (1.1)	98 (0.3)	81 (1.1)	25 (1.6)	1 (0.2)	276 (1.0)	98 (0.4)	79 (1.1)	23 (1.2)	1 (0.3)
New Hampshire	278 (1.0) »	99 (0.3)	82 (1.0) >	23 (1.3)	1 (0.2)	273 (0.9)	99 (0.4)	78 (1.4)	19 (1.2)	1 (0.2)
New Jersey	271 (1.6)	97 (0.6)	73 (1.8)	22 (1.4)	1 (0.3)	270 (1.1)	98 (0.6)	71 (1.4)	20 (1.1)	1 (0.2)
New Mexico	259 (0.9) >	96 (0.6)	61 (1.3)	10 (0.8)	0 (0.1)	256 (0.7)	96 (0.5)	57 (1.2)	10 (0.9)	0 (0.2)
New York	266 (2.1)	94 (1.2)	68 (2.3)	19 (1.2) >	1 (0.2)	261 (1.4)	94 (0.9)	63 (1.6)	15 (0.9)	1 (0.3)
North Carolina	258 (1.2) »	95 (0.6) <	59 (1.4) »	11 (0.9) >	0 (0.1)	250 (1.1)	92 (0.7)	51 (1.4)	8 (0.7)	0 (0.1)
North Dakota	283 (1.2)	100 (0.2)	87 (1.1)	28 (1.6)	0 (0.2)	281 (1.2)	99 (0.3)	86 (1.4)	26 (1.8)	1 (0.4)
Ohio	267 (1.5)	97 (0.5)	70 (1.7)	17 (1.3)	0 (0.2)	264 (1.0)	97 (0.4)	66 (1.3)	14 (1.0)	0 (0.1)
Oklahoma	267 (1.2) >	97 (0.4)	72 (1.6) >	16 (1.2)	0 (0.1)	263 (1.3)	97 (0.5)	66 (1.5)	13 (1.1)	0 (0.2)
Pennsylvania	271 (1.5)	98 (0.6)	73 (1.6)	20 (1.4)	0 (0.2)	266 (1.6)	97 (0.6)	69 (2.0)	16 (1.3)	1 (0.2)
Rhode Island	265 (0.7) »	97 (0.4) >	68 (1.2) »	15 (0.9)	0 (0.2)	260 (0.6)	95 (0.5)	61 (0.7)	14 (0.7)	0 (0.2)
South Carolina	260 (1.0)	96 (0.6)	60 (1.2)	14 (1.0)	0 (0.1)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Tennessee	258 (1.4)	95 (0.6)	59 (1.8)	11 (1.0)	0 (0.1)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Texas	264 (1.3) >	96 (0.4)	64 (1.5)	17 (1.2) >	1 (0.3)	258 (1.4)	95 (0.8)	59 (1.6)	12 (1.1)	0 (0.2)
Utah	274 (0.7)	99 (0.3)	78 (1.1)	21 (1.1)	0 (0.2)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Virginia	267 (1.2)	97 (0.3)	68 (1.4)	18 (1.0)	1 (0.2)	264 (1.5)	97 (0.5)	64 (1.5)	17 (1.5)	1 (0.4)
West Virginia	258 (1.0)	97 (0.5)	60 (1.6)	9 (0.8)	0 (0.0)	256 (1.0)	96 (0.6)	57 (1.4)	9 (0.8)	0 (0.1)
Wisconsin	277 (1.5)	98 (0.4)	80 (1.8)	26 (1.3)	1 (0.2)	274 (1.3)	99 (0.4)	78 (1.5)	22 (1.4)	1 (0.2)
Wyoming	274 (0.9) >	99 (0.3)	79 (1.1)	19 (0.9)	0 (0.2)	272 (0.7)	99 (0.2)	78 (1.0)	18 (0.9)	0 (0.1)
TERRITORIES										
Guam	234 (1.0) >	80 (1.1)	34 (1.4)	5 (0.6)	0 (0.1)	232 (0.7)	79 (1.0)	32 (1.2)	4 (0.3)	0 (0.1)
Virgin Islands	222 (1.1) >	78 (1.7)	18 (1.4)	1 (0.3)	0 (0.0)	219 (0.9)	74 (1.3)	14 (1.0)	1 (0.3)	0 (0.0)

»The value for 1992 was significantly higher than the value for 1990 at about the 95 percent certainty level. «The value for 1992 was significantly lower than the value for 1990 at about the 95 percent certainty level. These notations indicate statistical significance from a multiple comparison procedure based on the 37 jurisdictions participating in both 1992 and 1990. If looking at only one state, then > and < also indicate differences that are significant. Statistically significant differences between 1990 and 1992 for the state comparison samples for the nation and regions are not indicated. (xxx) Did not participate in the 1990 Trial State Assessment.

even fewer students -- one-fifth at grade 8 and one-half at grade 12 -- had success with fractions, decimals, and percents or elementary geometry and algebra. Few students (an estimated 6 percent) at grade 12 consistently solved relatively complex problems involving geometric relationships, algebra, or functions.

TABLE 9 presents average performance across the five content areas included in the assessment, as well as for the special estimation section. TABLE 10 displays comparable information for the participating states and territories. The increases in average proficiency in algebra and functions across the nation and the states are consistent with recommendations included in the *NCTM Standards* to place more emphasis on algebra in school mathematics. FIGURE 7 shows the average proficiency in 20 percent bands or quintiles of state performance across the mathematics content areas. Students in Iowa, Maine, Minnesota, New Hampshire, North Dakota, and Wisconsin had average proficiency in the top 20 percent of participating jurisdictions across all mathematics content areas at both grades 4 and 8.

TABLE 9 Average Proficiency in Mathematics Content Areas, Grades 4, 8, and 12

Grade	Years	Average Proficiency	Numbers and Operations	Measurement	Geometry	Data Analysis, Statistics, and Probability	Algebra and Functions	Estimation
4	1992	218(0.7)>	216(0.8)>	224(0.8)>	221(0.7)>	219(0.9)	217(0.9)>	208(1.5)>
	1990	213(0.9)	210(1.1)	218(1.0)	213(0.9)	--	214(0.9)	200(1.5)
8	1992	268(0.9)>	272(0.8)>	266(1.2)>	263(0.9)>	268(1.1)>	267(1.0)>	271(1.3)
	1990	263(1.3)	267(1.3)	259(1.6)	260(1.3)	263(1.6)	261(1.2)	269(1.2)
12	1992	299(0.9)>	298(0.9)>	297(0.9)>	300(1.0)>	298(1.0)>	300(1.0)>	294(1.2)
	1990	294(1.1)	293(1.1)	292(1.3)	295(1.3)	294(1.2)	296(1.2)	292(1.2)

> The value for 1992 was significantly higher than the value for 1990 at about the 95 percent confidence level. < The value for 1992 was significantly lower than the value for 1990 at about the 95 percent confidence level. The standard errors of the estimated percentages and proficiencies appear in parentheses. It can be said with 95 percent certainty for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample. In comparing two estimates, one must use the standard error of the difference (see Appendix for details).

TABLE 10 | **Average Proficiency in Mathematics Content Areas**

PUBLIC SCHOOLS	Grade 4 - 1992					
	Numbers and Operations	Measurement	Geometry	Data Analysis, Statistics, and Probability	Algebra and Functions	Estimation
NATION	214 (0.9)	222 (0.9)	220 (0.7)	218 (1.0)	216 (0.9)	206 (1.8)
Northeast	220 (2.2)	227 (2.3)	224 (2.2)	223 (2.3)	222 (2.2)	205 (6.8)!
Southeast	205 (2.0)	214 (2.1)	212 (1.6)	210 (2.2)	206 (2.2)	195 (3.9)
Central	219 (2.3)	228 (2.4)	224 (2.0)	223 (2.3)	220 (2.1)	212 (4.3)
West	214 (1.8)	221 (1.6)	222 (1.3)	217 (1.9)	215 (1.9)	213 (3.5)
STATES						
Alabama	204 (1.8)	213 (1.7)	209 (1.4)	209 (1.7)	204 (1.8)	198 (1.9)
Arizona	210 (1.4)	219 (1.3)	219 (1.0)	214 (1.3)	213 (1.6)	205 (1.4)
Arkansas	205 (1.1)	215 (1.7)	212 (1.3)	211 (1.3)	206 (1.0)	197 (1.6)
California	204 (1.8)	210 (1.8)	213 (1.6)	206 (1.6)	208 (2.0)	202 (1.8)
Colorado	216 (1.1)	225 (1.2)	227 (1.0)	220 (1.2)	217 (1.3)	212 (1.2)
Connecticut	223 (1.3)	230 (1.2)	230 (1.3)	225 (1.7)	225 (1.4)	217 (1.4)
Delaware	214 (0.9)	220 (0.9)	219 (0.9)	219 (1.4)	215 (1.3)	203 (1.5)
Dist. Columbia	189 (0.7)	193 (0.9)	198 (0.9)	189 (0.9)	191 (0.7)	171 (1.0)
Florida	208 (1.6)	219 (1.8)	215 (1.2)	214 (1.5)	211 (2.3)	200 (1.9)
Georgia	211 (1.3)	219 (1.5)	216 (1.2)	218 (1.3)	213 (2.4)	199 (1.5)
Hawaii	211 (1.4)	216 (1.7)	218 (1.2)	212 (1.5)	210 (1.7)	199 (1.7)
Idaho	216 (1.3)	227 (1.0)	226 (1.1)	219 (1.0)	217 (1.2)	211 (1.2)
Indiana	216 (1.3)	226 (1.4)	223 (1.2)	222 (1.3)	218 (1.9)	210 (1.6)
Iowa	227 (1.3)	234 (1.4)	229 (1.0)	230 (1.0)	226 (1.4)	221 (1.4)
Kentucky	211 (1.2)	218 (1.1)	215 (1.1)	215 (1.4)	212 (1.5)	205 (1.3)
Louisiana	199 (1.5)	208 (1.6)	206 (1.7)	204 (1.8)	201 (2.0)	188 (1.7)
Maine	227 (1.4)	236 (1.4)	236 (0.9)	231 (1.3)	228 (1.8)	220 (1.5)
Maryland	214 (1.4)	220 (1.7)	219 (1.2)	217 (1.5)	215 (1.4)	200 (1.5)
Massachusetts	224 (1.2)	229 (1.6)	229 (1.2)	225 (1.5)	222 (1.4)	217 (1.4)
Michigan	215 (1.9)	225 (2.0)	222 (1.7)	218 (1.8)	216 (2.2)	209 (2.2)
Minnesota	225 (1.2)	233 (1.3)	230 (0.9)	227 (1.2)	225 (1.1)	223 (1.4)
Mississippi	198 (1.3)	206 (1.5)	202 (1.0)	199 (1.5)	195 (1.3)	188 (1.6)
Missouri	217 (1.4)	226 (1.7)	224 (1.1)	223 (1.4)	220 (1.3)	211 (1.7)
Nebraska	221 (1.5)	230 (1.5)	229 (1.2)	225 (1.7)	220 (1.7)	216 (1.5)
New Hampshire	225 (1.3)	234 (1.5)	233 (1.2)	229 (1.6)	227 (1.5)	222 (1.5)
New Jersey	225 (1.6)	230 (1.9)	226 (1.4)	225 (1.6)	224 (2.0)	213 (1.9)
New Mexico	207 (1.8)	216 (1.6)	219 (1.2)	214 (1.6)	210 (2.0)	203 (1.8)
New York	215 (1.4)	221 (1.7)	218 (1.2)	221 (1.6)	215 (1.7)	204 (1.8)
North Carolina	208 (1.3)	216 (1.3)	215 (1.6)	214 (1.3)	210 (1.4)	198 (1.4)
North Dakota	224 (0.9)	235 (1.3)	229 (1.0)	229 (1.3)	225 (1.2)	222 (1.3)
Ohio	214 (1.4)	223 (1.6)	221 (1.3)	218 (1.4)	216 (1.4)	210 (1.4)
Oklahoma	216 (1.1)	224 (1.3)	220 (1.1)	221 (1.5)	217 (1.5)	211 (1.4)
Pennsylvania	221 (1.6)	229 (1.6)	223 (1.2)	223 (1.5)	221 (1.4)	212 (1.6)
Rhode Island	212 (1.7)	218 (1.8)	216 (1.6)	213 (1.6)	212 (1.9)	206 (1.8)
South Carolina	208 (1.2)	218 (1.6)	215 (1.1)	211 (1.4)	207 (1.5)	195 (1.5)
Tennessee	207 (1.5)	213 (1.4)	211 (1.6)	211 (1.6)	209 (1.7)	200 (1.5)
Texas	214 (1.4)	220 (1.6)	220 (1.4)	218 (1.4)	216 (1.4)	199 (1.7)
Utah	219 (1.2)	229 (1.1)	227 (0.9)	221 (1.3)	221 (1.1)	213 (1.0)
Virginia	217 (1.6)	224 (1.5)	222 (1.3)	223 (1.3)	217 (1.6)	206 (1.5)
West Virginia	210 (1.2)	223 (1.3)	217 (1.0)	214 (1.2)	211 (1.4)	204 (1.4)
Wisconsin	225 (1.3)	234 (1.2)	228 (1.2)	229 (1.2)	225 (1.4)	219 (1.7)
Wyoming	221 (1.1)	230 (1.2)	228 (1.1)	224 (1.1)	222 (1.2)	216 (1.1)
TERRITORY						
Guam	188 (1.1)	192 (1.1)	201 (1.2)	189 (0.9)	192 (1.0)	173 (0.8)

The standard errors of the estimated proficiencies appear in parentheses. It can be said with 95 percent certainty that for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample. ! Interpret with caution - the nature of the sample does not allow accurate determination of the variability of this estimated statistic.

TABLE 10 | **Average Proficiency in Mathematics Content Areas (continued)**

PUBLIC SCHOOLS	Grade 8 - 1992						Grade 8 - 1990				
	Numbers and Operations	Measurement	Geometry	Data Analysis, Statistics, and Probability	Algebra and Functions	Estimation	Numbers and Operations	Measurement	Geometry	Data Analysis, Statistics, and Probability	Algebra and Functions
NATION	270 (0.9)	264 (1.3)	262 (1.0)	267 (1.2)	266 (1.1)	269 (1.5)	266 (1.3)	258 (1.6)	259 (1.4)	262 (1.6)	260 (1.3)
Northeast	271 (2.7)	265 (3.9)	263 (3.1)	269 (3.5)	266 (2.8)	269 (5.1)	272 (2.9)	267 (4.2)	268 (3.3)	273 (3.9)	268 (3.3)
Southeast	263 (1.2)	253 (1.6)	253 (1.3)	258 (1.7)	259 (1.3)	264 (2.6)	260 (2.8)	248 (2.9)	251 (2.8)	253 (3.2)	256 (2.4)
Central	277 (2.2)	272 (2.7)	269 (2.1)	274 (2.5)	272 (2.5)	274 (2.6)	270 (2.0)	262 (3.0)	261 (2.7)	265 (2.6)	262 (2.4)
West	270 (1.8)	266 (2.8)	263 (2.2)	267 (2.4)	266 (2.6)	270 (2.0)	263 (2.5)	257 (3.2)	260 (2.6)	261 (3.2)	259 (2.6)
STATES											
Alabama	258 (1.4)	245 (2.3)	245 (1.9)	250 (2.1)	253 (1.9)	260 (1.1)	259 (1.1)	248 (1.4)	249 (1.3)	251 (1.5)	252 (1.3)
Arizona	269 (1.2)	264 (2.3)	260 (1.0)	265 (1.7)	264 (1.5) >	269 (1.1)	265 (1.3)	257 (1.6)	256 (1.3)	259 (1.9)	258 (1.5)
Arkansas	262 (1.3)	251 (1.3)	250 (1.5)	254 (1.5)	255 (1.5)	263 (1.3)	262 (0.8)	254 (1.3)	253 (0.9)	255 (1.1)	253 (1.1)
California	263 (1.7)	258 (2.1) >	259 (1.9)	258 (2.2)	258 (2.2)	263 (1.4)	260 (1.3)	252 (1.4)	256 (1.3)	255 (1.6)	256 (1.3)
Colorado	273 (1.1) >	273 (1.6) »	269 (1.1)	274 (1.4)	270 (1.1) >	273 (0.9)	269 (1.0)	265 (1.2)	266 (1.1)	270 (1.1)	266 (1.0)
Connecticut	277 (1.3)	275 (1.6) >	268 (1.0)	274 (1.5)	270 (1.4)	275 (1.1)	274 (1.0)	268 (1.6)	266 (1.1)	271 (1.5)	268 (1.5)
Delaware	267 (1.0)	258 (1.5)	257 (1.1)	262 (1.3)	263 (1.3)	264 (0.9)	265 (0.9)	259 (1.2)	256 (1.1)	262 (1.5)	259 (1.0)
Dist. Columbia	243 (0.8) >	221 (1.6)	231 (1.3)	229 (1.2) >	237 (1.1)	241 (0.8)	239 (0.9)	222 (1.4)	229 (1.1)	223 (1.4)	235 (1.1)
Florida	264 (1.4)	254 (2.1)	255 (1.3)	259 (1.8)	260 (1.6)	264 (1.1)	260 (1.2)	252 (1.5)	251 (1.3)	255 (1.7)	255 (1.5)
Georgia	265 (1.1)	253 (2.1)	253 (1.4)	259 (1.6)	259 (1.4)	263 (0.9)	263 (1.3)	253 (1.5)	257 (1.4)	260 (1.6)	257 (1.5)
Hawaii	261 (0.9) »	254 (1.0) >	257 (1.2) >	249 (1.5) >	256 (1.1) »	260 (0.8)	257 (0.7)	249 (0.9)	252 (0.7)	243 (1.1)	249 (1.0)
Idaho	277 (0.8)	276 (1.4) >	271 (0.9)	274 (1.1)	274 (0.9) >	274 (0.6)	275 (0.8)	269 (1.1)	269 (1.1)	273 (0.8)	270 (0.9)
Indiana	272 (1.3)	269 (1.7)	266 (1.2)	273 (1.5)	267 (1.3)	271 (0.9)	271 (1.1)	265 (2.0)	264 (1.2)	269 (1.3)	265 (1.2)
Iowa	285 (1.0)	287 (1.6) »	278 (1.2)	285 (1.4)	280 (1.2) >	282 (0.9)	282 (1.0)	276 (1.6)	274 (1.3)	280 (1.2)	275 (1.2)
Kentucky	266 (1.1) >	259 (1.3) >	256 (1.1)	262 (1.8)	260 (1.4)	266 (0.9)	261 (1.2)	254 (1.2)	253 (1.3)	258 (1.3)	257 (1.3)
Louisiana	256 (1.6)	242 (2.0)	244 (1.7)	248 (1.9)	249 (1.9)	258 (1.4)	253 (1.2)	241 (1.4)	243 (1.3)	243 (1.6)	246 (1.5)
Maine	280 (1.2)	282 (1.5)	274 (0.9)	282 (1.4)	274 (1.2)	275 (1.0)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Maryland	269 (1.3)	261 (1.7)	259 (1.3)	266 (1.4)	264 (1.6)	264 (1.1)	264 (1.3)	256 (1.7)	257 (1.5)	261 (1.7)	262 (1.6)
Massachusetts	276 (1.0)	270 (1.5)	267 (1.1)	274 (1.5)	271 (1.4)	275 (0.9)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Michigan	270 (1.3)	266 (2.0)	261 (1.5)	268 (1.4)	267 (1.6)	268 (1.2)	269 (1.2)	261 (1.5)	261 (1.2)	265 (1.7)	264 (1.3)
Minnesota	282 (1.1)	285 (1.5) »	278 (1.1) >	284 (1.4) >	281 (1.1) »	284 (0.8)	279 (1.1)	272 (1.2)	272 (1.0)	279 (1.1)	274 (1.1)
Mississippi	256 (1.2)	236 (2.1)	239 (1.2)	243 (1.8)	245 (1.6)	259 (1.0)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Missouri	272 (1.3)	271 (1.8)	266 (1.3)	272 (1.6)	270 (1.4)	271 (1.1)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Nebraska	279 (1.1)	278 (1.7)	274 (1.3)	278 (1.7)	275 (1.5)	277 (1.0)	279 (1.0)	273 (1.6)	273 (1.2)	278 (1.1)	273 (1.0)
New Hampshire	280 (0.9) »	280 (1.9) >	273 (1.0)	281 (1.4) >	274 (1.0)	277 (0.9)	275 (0.9)	272 (1.6)	271 (1.0)	275 (1.2)	272 (1.0)
New Jersey	276 (1.6)	268 (2.2)	265 (1.7)	271 (2.1)	272 (1.8)	274 (1.3)	274 (1.2)	267 (1.4)	266 (1.2)	270 (1.4)	268 (1.4)
New Mexico	263 (1.0) >	257 (1.5)	256 (0.9)	258 (1.4)	257 (1.1)	265 (1.0)	259 (0.8)	254 (1.0)	257 (0.7)	253 (1.3)	257 (0.9)
New York	270 (1.9) >	262 (2.5)	261 (2.4)	268 (2.9)	265 (2.4)	266 (1.8)	264 (1.3)	255 (2.1)	260 (1.5)	263 (1.7)	260 (1.4)
North Carolina	261 (1.3) >	253 (1.8) »	254 (1.4) >	258 (1.4) »	259 (1.5) »	263 (1.0)	256 (1.1)	242 (1.3)	249 (1.1)	248 (1.6)	251 (1.2
North Dakota	286 (1.2)	285 (1.9)	277 (1.3)	286 (1.4)	279 (1.2)	283 (1.0)	286 (1.3)	279 (1.6)	278 (1.3)	285 (1.6)	275 (1.2)
Ohio	272 (1.5)	266 (2.3)	262 (1.3)	270 (2.1)	267 (1.8)	269 (1.1)	269 (1.1)	259 (1.3)	260 (1.1)	266 (1.1)	262 (1.0)
Oklahoma	271 (1.3)	266 (2.3) >	262 (1.3)	269 (1.5)	267 (1.3)	271 (0.9)	268 (1.3)	258 (1.6)	260 (1.4)	264 (2.1)	262 (1.3)
Pennsylvania	274 (1.6)	271 (2.0)	265 (1.5)	273 (1.8)	270 (1.5)	272 (1.3)	270 (1.7)	264 (2.0)	263 (1.7)	268 (1.9)	265 (1.6)
Rhode Island	269 (0.7) »	263 (1.1) »	259 (0.8) >	266 (1.2) »	266 (1.3) >	269 (0.7)	264 (0.6)	257 (0.7)	256 (0.9)	259 (0.7)	261 (0.9
South Carolina	265 (1.0)	257 (1.6)	256 (1.2)	258 (1.4)	259 (1.3)	264 (0.9)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Tennessee	264 (1.3)	253 (2.0)	252 (1.5)	259 (1.6)	257 (1.7)	264 (1.4)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Texas	267 (1.4)	260 (1.7) >	262 (1.5)	263 (1.6)	266 (1.4) »	267 (0.9)	262 (1.3)	254 (1.5)	258 (1.4)	257 (1.8)	256 (1.6)
Utah	276 (0.8)	275 (1.3)	269 (1.2)	275 (1.1)	272 (1.0)	274 (0.7)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)	xxx (xxx)
Virginia	272 (1.1)	265 (1.7)	261 (1.3)	268 (1.4)	267 (1.4)	271 (1.1)	268 (1.4)	260 (1.8)	261 (1.6)	264 (1.9)	265 (1.6)
West Virginia	263 (1.0)	256 (1.6)	254 (1.1)	260 (1.2)	257 (1.3)	263 (0.8)	260 (1.0)	253 (1.2)	254 (1.0)	256 (1.6)	254 (1.1)
Wisconsin	280 (1.5)	279 (2.0)	272 (1.6)	280 (2.1)	275 (1.6)	278 (1.1)	278 (1.4)	273 (1.6)	272 (1.5)	277 (1.4)	271 (1.2)
Wyoming	276 (0.8)	278 (1.2) »	272 (0.7)	275 (1.3)	271 (1.2)	276 (0.9)	275 (0.7)	270 (0.8)	270 (0.7)	273 (1.0)	270 (0.8)
TERRITORIES											
Guam	240 (1.3)	228 (1.6)	239 (1.4)	221 (1.9) >	235 (1.1) >	244 (1.1)	240 (0.7)	229 (1.3)	236 (1.1)	214 (1.2)	230 (1.0)
Virgin Islands	231 (1.0)	211 (1.7)	222 (0.8)	214 (2.5) »	221 (1.2)	231 (1.5)	229 (1.0)	216 (2.0)	223 (1.3)	196 (2.0)	219 (1.5)

»The value for 1992 was significantly higher than the value for 1990 at about the 95 percent certainty level. «The value for 1992 was significantly lower than the value for 1990 at about the 95 percent certainty level. These notations indicate statistical significance from a multiple comparison procedure based on the 37 jurisdictions participating in both 1992 and 1990. If looking at only one state, then > and < also indicate differences that are significant. Statistically significant differences between 1990 and 1992 for the state comparison samples for the nation and regions are not indicated.

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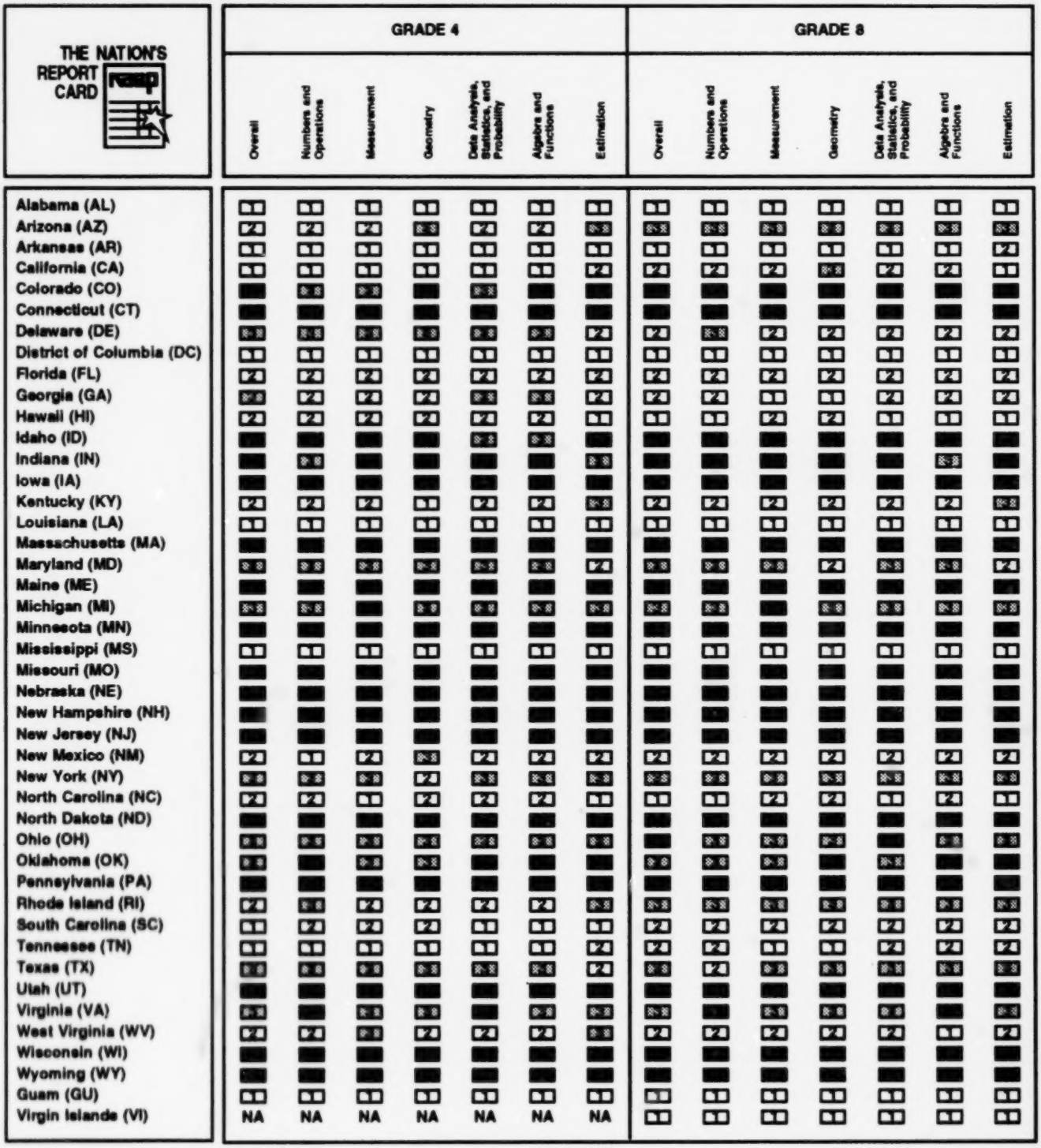
FIGURE 7

Average Proficiency by Mathematics Subscales for Five Performance Bands (Quintiles) 1992 Grades 4 and 8



States categorized in the bottom 20 percent of performance have average mathematics proficiencies in the lowest fifth of the average mathematics proficiency distribution of all states and are indicated by the number 1 (first quintile). States with average proficiencies in the top 20 percent of the distribution are indicated by the number 5 (fifth quintile). The numbers 2, 3, and 4 indicate states with average proficiencies in the second, third, and fourth fifths of the distribution.

NA Grade 4 data for the Virgin Islands are not available.

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